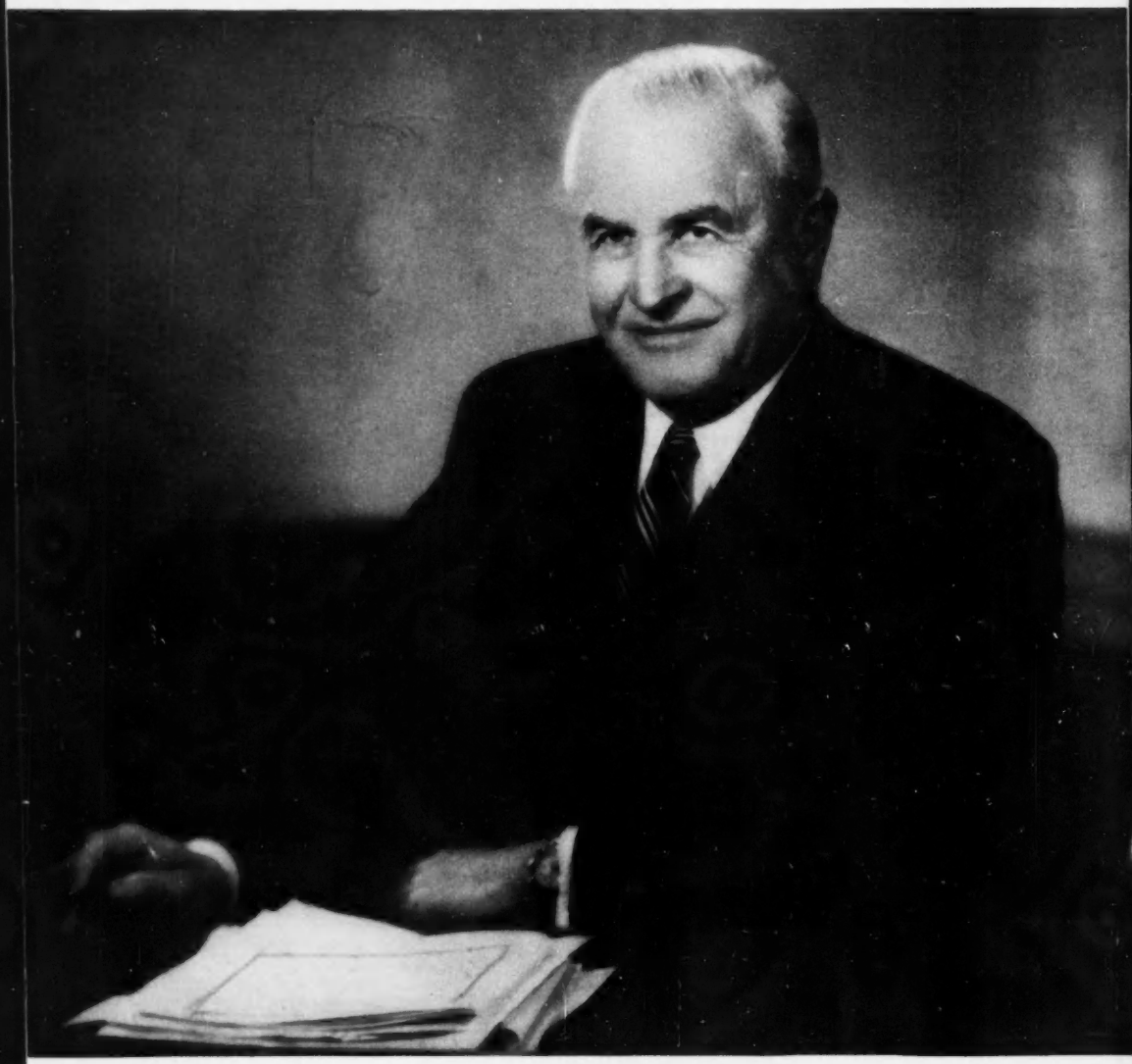
JUNE 9, 1952 NEWS ISSUE

Electrical World

Price 35 Cents A McGRAW-HILL PUBLICATION



James B. Black: His Pacific Gas & Electric Co Wins the Coffin Award . . . Page 7

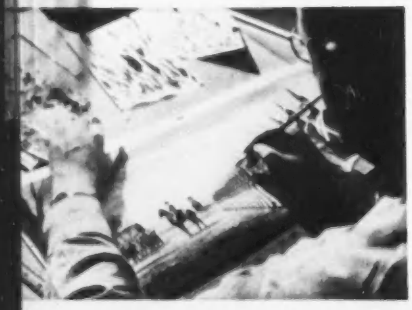
TVA Planning 8.1 Million-Kw Capacity . . . Page 18

Industrial Output Dropping; Fall Rise Likely . . . Page 50

"Story board" showing sequence of scenes used in planning of "Freedom and Power" film is explained by C. H. Lang, G E Vice President—Public Relations. Interested listeners are Colonel Bennion, Managing Director of the Edison Electric Institute, and Wilgar Coleman, also of E.E.I.

The story every electric utility will want to tell

"FREEDOM AND POWER"



New technique in animation developed by Raphael Wolff Studios is a feature of the film. Above, a Hollywood artist works on one of the historical scenes done in full color.

Now in production—a dramatic color motion picture for educational use by the electric utility industry

"Freedom and Power," a new educational motion picture now in preparation, will be a significant tool to help inform public groups on the importance of the electrical industry to the nation's welfare and security.

Latest of General Electric's More Power to America programs, it will highlight the development and importance of the electric power industry against an inspiring background of America's historic struggle for freedom.

In 25 minutes of animation and live action, it traces the story of free men working to produce a degree of industrial progress and freedom from drudgery far beyond that achieved by any other country. The prominent role of the electric utility is particularly emphasized.

The film is being produced in Hollywood by Raphael Wolff Studios.

Here is a new and dynamic tool for community and customer relations. Preview releases will be timed for Production for Freedom celebration, to be observed early in September as a part of the industry's Public Information Program. General Electric Company, Schenectady 5, N. Y. 301-193

Right—lights and camera focus on a large turbine generator, for one of the "Freedom and Power" scenes showing the part played by electric utilities in making possible today's freedoms.

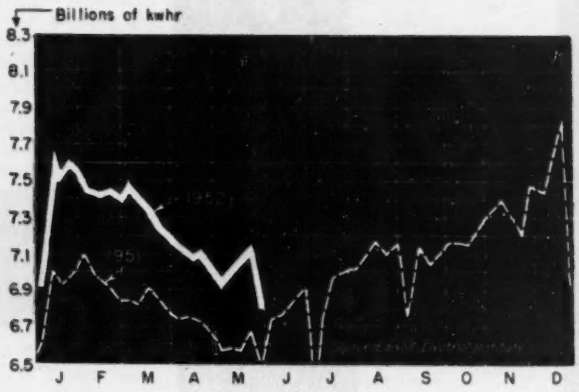
MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 137, NO. 23

June 9, 1952

Electrical World



Output Week Ended May 31—6,810,727,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
May 31	+5.7	+3.6	+5.6	+3.9	+3.7	+12.6	−0.1	+3.6	+2.0	+8.3
May 24	+7.4	+1.6	+4.0	+6.6	+6.0	+15.7	+7.4	+7.7	+4.9	+7.3
May 17	+8.4	+5.6	+5.7	+7.3	+6.0	+15.5	+10.3	+8.7	+5.0	+7.9

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Loads (Million Kw)	Mar.	66.5*	66.9	61.4
Capacity (Million Kw)	Mar.	76.34	75.99	70.25
Production (Billion Kwhr)	Mar.	33.04	31.54	30.92
Hydro		10.44	9.46	9.22
Fuel		22.60	22.07	21.70
Fuel Consumption				
Coal (Million Tons)	Mar.	8.84	8.74	9.03
Oil (Million Barrels)		5.22	4.77	5.53
Gas (Billion Cu Ft)		57.39	54.82	48.48
Sales (Billion Kwhr)	Mar.	29.03	29.08	26.77
Residential		8.32	8.51	7.35
Commercial		4.85	4.87	4.44
Industrial		13.98	13.82	13.12
Other		1.87	1.88	1.86
Net Income Class A & B Companies ($ Million)	Mar.	82.84	88.00	71.13
Estimated Dec. 52 Peak (Million Kw)	Mar.	80.4	80.5	78.2
Kwhr per Residential Customer (12 Month Average)	Feb.	2,037	2,021	1,867
Revenue per Kwhr Residential Service (12 Month Average)	Feb.	2.80¢	2.81¢	2.86¢
Canadian Production (Billion Kwhr)	Mar.	5.22	4.97	4.91

Business Statistics

		Latest Month	Preceding Month	Year Ago
FRB Industrial Production Index†††	Apr.	214*	217	222
Gross National Product Annual Rate ($ Billion)	1st Qtr.	339.0*	334.6	319.5
E. W. S Industry Production Index	Apr.	124.0*	123.8	122.6
ENR Construction Cost Index††	May	116.8	116.2	113.6
BLS Consumer's Price Index	Apr.	188.7	188.0	184.6
NEMA Insulation Materials, Sales Index†	Mar.	536	528	662
NEMA Electric Appliance Sales Index†	Mar.	278	224	422
NEMA Household Refrig. Sales Index†	Mar.	163	153	330

* Estimated. † 1936=100 †† 1949=100 ††† 1937-39=100 (Unadjusted)

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ELECTRICAL WORLD • Vol 137, No 23 June 9, 1952
Member ABC and ABP

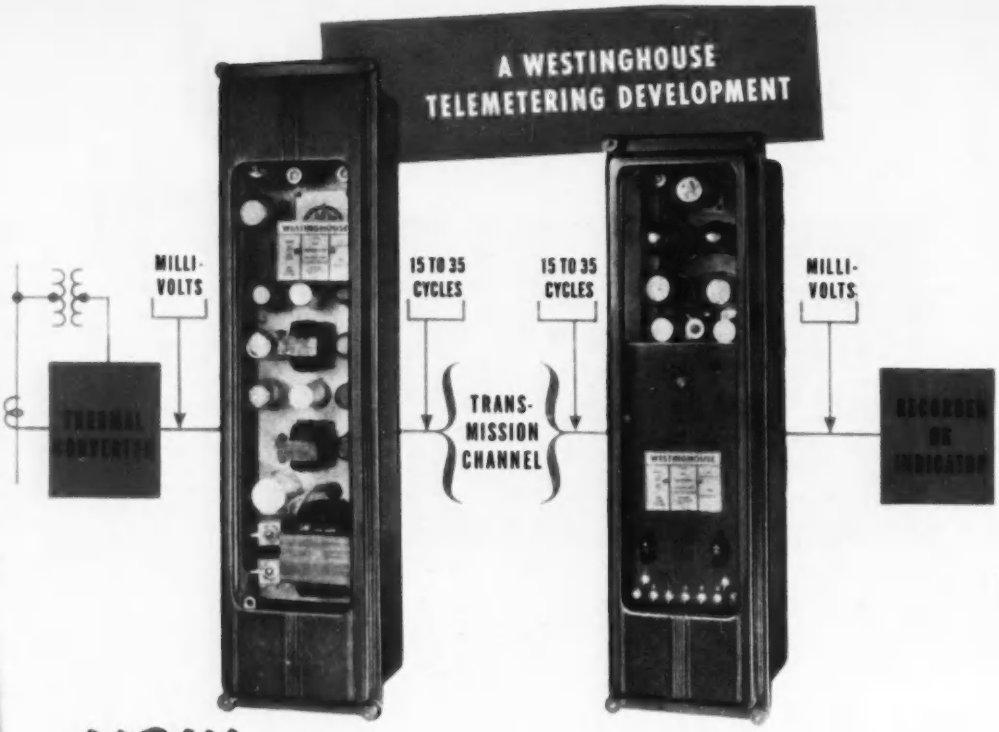
Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y.

Executive, Editorial and Advertising Office: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions; Address correspondence to Electrical World—Subscription Service, 99-129 North Broadway, Albany 1, N. Y. or 330 W. 42nd St., New York 36, N. Y. Allow two days for change of address.

Subscriptions are accepted only from executive, supervisory, and engineering personnel in electric utilities, manufacturing companies, and related fields. Position and company connection must be indicated on subscription orders.

Single copies $1ef. For the United States and possessions $6 a year, $10 for two years. Canada, $7 for one year, $11 for two years, $14 for three years. (Canadian money at par.) Other Western Hemisphere, $15 for one year, $25 for two years, $30 for three years. All other countries $25 for one year, $40 for two years, $50 for three years. Entered as second class matter, November 16, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in U.S.A. Copyright 1952, by McGraw-Hill Publishing Company, Inc. Permission required to reproduce any of contents.



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YOU CAN BE SURE... IF IT'S
Westinghouse
Freq-O-Tron
TELEMETERING

THE ELECTRICAL WEEK

Featured in This Issue

Pacific Gas & Electric Co wins the Coffin Award for 1951 (p 7) . . . Objectives listed by public power at Electric Consumers Conference add up to continued harassment of private utilities (p 9) . . . PEA Prime Movers Committee discusses gas recirculation as means of steam temperature control (p 15) . . . TVA no longer boasts of abundant power, but instead plants to add 8.1 million kw capacity to meet loads (p 18) . . . AEC Commissioner Glennan outlines steps private companies can take to aid development of atomic power (p 30) . . . Public Service of Colorado is enthusiastic about its conference-classroom on wheels (p 34) . . . Outlook is bright for electric power equipment manufacturers, EEI survey reveals (p 46) . . . Industrial output drops again in second quarter, but rise is expected in the fall (p 50).

• • •

Latest from Cleveland—Bayard ("Pat") L. England, president of Atlantic City Electric Co has been elected president of Edison Electric Institute. Walter H. Sammis, president of Ohio Edison Co succeeds England as vice president. A. B. Morgan has been appointed secretary. At the opening session of EEI's 20th annual convention, George M. Gadsby, outgoing president, told the 2,000 representatives of the industry that "in conducting the fight we have against the encroachment of the federal government in a proprietary capacity in the manufacture and sale of electricity, we have been fighting for the freedom of all industry."

Newly elected EEI directors are: (1953) W. L. Cisler, president, Detroit Edison; (1954) Robert P. Briggs, executive vice president, Consumers Power; and Harold Quinton, executive vice president, Southern California Edison; (1955) A. D. Barney, chairman of board, Hartford Electric Light; G. M. Gadsby, president, Utah Power & Light; A. H. Kehoe, vice president, Consolidated Co of N. Y.; Allen S. King, executive vice president, Northern States Power (Minn.); E. J. Machold, president, Niagara Mohawk Power; P. B. McKee, president, Pacific Power & Light; S. C. McMeekin, president, South Carolina Electric & Gas; G. C. Neff, president, Wisconsin Power & Light; P. H. Powers, president, West Penn Power; R. G. Rincliffe, president, Philadelphia Electric; W. H. Sammis, president, Ohio Edison; C. V. Sorenson, vice president and general manager, Indiana & Michigan Electric; N. R. Sutherland, vice president and general manager, Pacific Gas & Electric; J. B. Thomas, president, Texas Electric Service; and Allen Van Wyck, president, Illinois Power.

Latest from Washington—To help streamline procedures for scheduling major power equipment, Depa has sent to all utilities a new form—DEPA-25 . . . Francis A. Kolb, special assistant to Depa Administrator Fairman, will be leaving government service about June 13 . . . Production capacity goals have been set up for electrical equipment manufacturers as a guide to granting tax amortization certificates . . . Democratic Sen Estes Kefauver of Tennessee was the first presidential candidate to make a bid for support of the Electric Consumers Conference (p 9) by sending conference a telegram of congratulations.

Truman asks Congress to vote $3.3 billion more for expansion of AEC's production facilities. Of the total $150 million would be for expansion of TVA power facilities to serve new AEC installations . . . Depa is expected to lessen its efforts to get utilities in coastal areas to use aluminum in their distribution systems. The move comes as a direct result of the discussion of life tests on aluminum-to-copper connections at recent meeting of EEI engineering committees (EW, May 19, p 125).

New York City's Board of Transportation and Consolidated Edison Co both deny they are negotiating for transfer of the city's transit power generating facilities to Con Ed, but reports that talks are being carried on keep cropping up.

From the Southeast—North Carolina voters slapped down two public power advocates in the recent Democratic primary . . . Myrtle Beach, S. C., City Council is planning to take up its option and buy the city's electrical distribution system from South Carolina Public Service (Santee Cooper) Authority.

Negotiations continued in New York last week on proposals of a power company group to meet a 1.8 million-kw load which AEC would have at its proposed Ohio Valley gaseous diffusion plant.

Rates—Seattle City Light claims it will have the lowest residential rate in the country for 450 kwhr in cities of 50,000 or larger when its new rates go into effect on July 1. The new rate will save $4.20 annually for the "all-electric" customer.

Construction—Connecticut Light & Power announces Electric Power, Inc., a wholly owned subsidiary, has asked FPC for permission to build a 37,250-kw single-generator hydroelectric plant on the Housatonic River . . . Grant County (Wash.) PUD announces plans to build $250-million Priest Rapids Dam on the Columbia River. The PUD claims dam will be the third largest power producer in the Pacific Northwest exceeded only by Grand Coulee and Chief Joseph Dams.

Labor—Westinghouse sets June 16 as deadline for its four major unions to accept a 1-to-2½¢ cost of living wage boost offered April 28. Company says if unions do not accept offer by then the effective date of May 1 will no longer hold . . . Fact-finding panel will submit its report June 12 to Gov. G. Mennen Williams in the wage dispute between employees and Consumers Power Co.

Congratulations—T. H. Vaden, formerly division manager of Alabama Power Co, has been elected a vice president by Southern Co to assist Pres C. B. McManus in the Atlanta office.

IN THE INDUSTRY

An Answer to Mr Truman

We are in that minority of industry people who believe that President Truman's speech before the Electric Consumers Conference should have been answered (EW, June 2, p 70). It was an opportunity we believe to point out certain facts that valid consumer groups may not always understand clearly. Such facts would include:

- An industry's right to avail itself of free speech through advertisements.
- The principle that electric energy is supplied at the cost of service without profit in the normal sense.
- The close supervision by Public Service Commissions over rates and the rate base used for their determination.
- Information that the Treasury Department is perfectly aware that depreciation rates for taxes are often different from those used for rate making.
- Mention that the federal government through the Interior Department is the only agency having the desire to monopolize the power resources of the country.

There are few average Americans who will have read Truman's speech. And there are still fewer who will understand much of his rambling "shadow boxing." For these reasons the answers will get far better readership over the country than the speech itself. It is also self evident that there is no real interest in the kind of propaganda device exhibited by the so-called Electric Consumers Conference among the consumers of electric energy themselves.

As illustrations of the right kind of answers for Mr Truman, we quote as follows:

Ernest R. Acker, president of Central Hudson Gas Electric Corp—

Truman's charge: "The private power companies are spending millions and millions of dollars on this (propaganda) campaign."

Answer: "It is the government that is carrying on the greater propaganda campaign. The American light and power companies are conducting advertising and publicity campaigns in reply to an ever increasing flow of government propaganda."

Truman: "Now, I don't object to the power companies making a profit, but I do object to their skinning the life out of the people".

Answer: "The power companies can no more charge exorbitant rates than the postmaster can charge 10¢ for a 3¢ stamp."

Louis V. Sutton, president of Carolina Power & Light Co—

"In reply to a request from one of the the newspapers for comment on the President's statement before the Electric Consumers Conference, a group working for public power in Washington, I will say I am amazed. Having taken over the steel industry and asserted his right to take over newspapers and radio, the President now apparently will ask his new attorney general to stop utilities from giving people the truth. He will ask the new attorney general to study the Corrupt Practices Act—not to clean up the corruption that has spilled out of bureaus and departments of his administration but to indict private power company officials for opposing his administration's program of socializing the power industry. Giving the public the truth and the facts, as we see them, in our advertising and publicity is our defense against a power-grabbing government which is trying to nationalize and socialize the industry. In my opinion, anyone who would deny America the truth is dangerous. Censorship is a device of dictatorship."

New York Daily News—

"Holding up copies of a couple of big magazines, Truman pointed to advertisements inserted in them by private power interests at a total cost of $29,000. The ads stated their backers' opinions on socialized power—and thereby, according to Truman, were some sort of crime.

"We don't know what kind of crime they were since the Constitution guarantees freedom of speech and press, and these advertisers were only speaking their minds freely through a part of the press and paying handsomely to do so."

Wall Street Journal—

"President Truman said . . . 'Now I don't object to the power companies making profit, but I do object to their skinning the life out of the people.' Plainly enough he implies that the private power companies fix their service rates themselves and put them atrociously high. When he gets around to the whistle-stopping facts, the President will doubtless point out that the service charges of the private power companies are set by public regulatory bodies, subject to appeal to the courts."

TECHNICAL NOTES

ARCHER E. KNOWLTON

Typical inertia constant of 10 for a system means that speed drop will be half completed in about 7 seconds. Speed reductions (due to system disturbance) lasting more than 30 seconds will draw heavily on heat energy stored in boilers.

Water-cooling of generators is typified by at least one U.S.A. installation. Hydrogen can do the cooling job adequately even for the large machines on the horizon.

One in three stations has loss-of-field protection on their generators. One in three has oil or gas-pressure protection on the transformer.

Silicone resin (15 parts) with bone black (5 parts), normal butyl alcohol and toluene (1 part each) makes a washable pigment for thermometer stem markings.

Research—the more is done, the more there is uncovered and left to be done—says Sarnoff of RCA.

Reclosers, in extensive use on rural circuits, will show up in suburban and urban areas as higher voltages are used there for distribution.

Voltage unbalance standards may have to be in the rule books if only to let air conditioner and other polyphase motor users know the service conditions the motors will be expected to meet.

The 235,000-kw addition that's being built at Contra Costa in California is part of the reason that . . .

Pacific G&E Captures a Coffin Award

More than one third of California's population came to the state within the last decade.

It was this huge influx that caused the operation that last week won for Pacific Gas & Electric Co the Charles A. Coffin Award for 1951. The award was presented at the 20th annual convention of Edison Electric Institute in Cleveland.

PG&E received the industry's most coveted honor:

"For successfully and adequately meeting the electric needs of one of the nation's most rapidly expanding regions with a privately financed construction program which is the largest ever undertaken in the utility industry; and at the same time resolving its problems of government competition with a program of cooperation which is in the best interest of customers, the public, and the taxpayers."

PG&E's expansion to meet California's expansion has been amazing. The company has matched in the last six years all the generating capacity it had installed in its previous history. And in doing so, it has run smack up against the expansion plans of the United States Bureau of Reclamation —primarily in the Central Valley area. The company's continued growth and its handling of power relationships with the government won the admiration of the industry and the Coffin Award committee alike.

Uncompromising Demand . . . Industry, agriculture, and business have grown apace with population in the Golden State. Demand for electric power has grown even more. And since demand is uncompromising, PG&E had to meet the challenge.

Half the people of California and half the demand are in its service area. To keep ahead of demand, the company since V-J day has been engaged in a billion dollar expansion program, something unparalleled in the industry. By 1954 it plans to have an installed capacity of 4,150,000 kw. Last year the company passed the three-quarter mark in its program and set records in almost every phase of its operations:

- Gross operating revenues rose to $279,499,000, an increase over the previous year of $42,061,000—largest annual gain in company history.
- Power sales reached 12,630,000,000 kwhr, a 14.4% rise over '51.
- A record high peak demand of 2,890,800 kw occurred Aug. 2, exceeding the previous record, set in 1950, by 15.2% reserve of 20% was available at the time of the peak, according to the company. (PG&E has a

CRANES are used to put Bear River Dam rock facing in place. The dam will be approximately 650 ft thick at the base and the facing will be about 30 ft thick at the bottom, tapering off to a lesser thickness at the top. The maximum height of the dam will be 245 ft

summer peak because of irrigation and vacation loads.)

- More new electric customers—68,958—were connected than in any previous year.
- Taxes paid or accrued aggregated $65,866,000, an increase of $11,163,000 over 1951.
- A record 566,666 kw was brought into service at a record cost of $152 million.

Normally a hydro system backed by steam, PG&E last year shifted its balance to 56.5% steam, 43.5% hydro. The company has 58 hydroelectric and 17 steam plants.

The pendulum is set to swing a bit more toward steam, then start on the backsweep. Additions of 235,000 kw each are being built at the Moss Landing and Contra Costa Steam Plants. Last year ground was broken for the 600,000-kw Pittsburg Plant, largest steam station in the state.

Now the company has announced plans for an additional $114 million development on the North Fork of the Feather River which would bring in another 364,000 kw. PG&E already has six plants on the river, generating 387,000 kw. Licenses for the new development are now under consideration by Federal Power Commission.

Another place the company would like to expand its hydro generation is the Kings River. But here, as elsewhere, they have run into competition from Reclamation, which wants to integrate this development with its Central Valley Project. The company contends the projects are separate and should not be integrated.

Kings Fight . . . The controversy on the Kings is a good example of conflicting interests between the private company and the federal government. PG&E built Balch Powerhouse on the Kings in 1922. In 1948 it asked FPC for permission to enlarge the plant by 240,000 kw. Reclamation opposed the application. The Bureau said it intended to take over Balch plant and construct a new power development on the Kings. After much argument, FPC granted the license to the company in December 1951. The bureau, through its parent Department of the Interior, appealed the FPC ruling to the courts, and there the matter rests.

After a ten year fight over distribution of Central Valley power from Reclamation's Shasta and Keswick dams, the company last year worked out a "wheeling" agreement with the bureau that may lead to the same kind of cooperation between the two in regard to power that has existed for years in regard to the project's irrigation water distribution.

100 Years . . . Pacific Gas & Electric Co this year celebrates its centennial anniversary. The earliest of its ancestors, San Francisco Gas Co, went into business in August, 1852. The company today represents the merger of 520 electric, gas, and water operations throughout northern and central California.

James B. Black, a native Californian, has been president during the period of greatest expansion. He came to PG&E in 1935 with 23 years service in the utility business already behind him. In that time he had risen to the position of vice president of the North American Co and vice president and director of Western Power Corp. He has taken an active part in directing the vast expansion program.

Principles of Public Power Lobby

"Statement of principles" adopted by the conference included these seven points:

1. Best service at lowest cost . . . "There must be the best possible electric service to consumers everywhere . . . at the lowest possible rates consistent with sound business principles."

2. Development of More Public Power . . . "All feasible potential public power resources of the nation, hydro or other, must be developed as rapidly as they can be soundly undertaken. Fuel burning generating plants must be permitted as they are needed."

3. Comprehensive Basin-wide Plans . . . River basins should be developed not for power production alone but in accordance with comprehensive, basin-wide plans. "Such full development must be done only by public agencies with widest practical participation of local public and cooperatives. The obstruction of such unified developments by the licensing of economically advantageous projects to private exploitative interests must be stopped. Outstanding licenses to exploit the public's hydroelectric power resources should be cancelled and recaptured as rapidly as possible."

4. Undiminished Benefits to Consumers . . . Benefits of the development of the public's power resources must reach consumers undiminished by any unnecessary added costs. Wheeling contracts, exchange, or rate arrangements violative of this principle must go. Public transmission facilities and aid to local agencies or cooperatives in the acquisition of distribution systems must be provided wherever need exists." (This is subject to revision to let power revenues carry part of irrigation costs on federal projects.)

5. Preference to Public Bodies . . . "Electric power publicly produced belongs to the public. The public has first preference right to it as such owners. It should not be supplied to industries and private profit distributors (1) if needed by the public agencies and consumers' cooperatives, or (2) without . . . control of resale rates. . . ."

6. Cleansing of Private Power . . . "The private power industry in America must be cleansed. Although its illegal, immoral, and degrading activities were exposed and condemned only two decades ago, the unreformed and unrepentant industry given a privileged monopoly position to supply a necessity of our lives, is today again charging and expending ratepayers' money as operating expense, to corrupt public sources of information, educational institutions, public agencies, and the functioning of our democratic institutions. There must be immediately established at every level of private utility operation a thorough and continuing investigation of all expenditures of moneys by power monopolists for propaganda, lobbying, political activity or corruption of public servants or institutions. Regulatory bodies, law enforcement agencies, and legislatures and the Congress itself must discharge their duty to the American people to expose punish and publicize unethical, immoral or illegal practices on a vigorous and continuing basis."

7. Continuous Cooperation . . . "There must be continuous cooperation of consumer groups, including the sponsors of this electric consumers conference and others not yet participating, to see that these basic principles and objectives are vigorously prosecuted."

Public Power Unveils Its Objectives

Electric Consumers Conference lists demands which add up to continued harassment of private companies

Public power advocates have put their cards on the table for this year's voting and next year's federal power policy.

Meeting in Washington May 26-27 under the name "Electric Consumers Conference" they drew up a list of their own election-year demands and created a standing committee to negotiate for them.

The demands add up to a policy of unbridled public power and continuous harassment of electric companies (see box). With this "statement of principles," the public power men hope to woo votes at the July conventions and the November elections. If they succeed, they will be in a position to write their own power policy next year.

Forum for Office Holders . . . With an eye on these comparatively long-range objectives, the five hundred delegates to the conference served as a handy forum for present office holders who rode to victory on a public power platform. Topping the speakers list was President Truman, who demonstrated his ideas of effective political action (EW, June 2, p 70). Among the speakers were four U. S. Senators: Republican Wayne L. Morse of Oregon and George D. Aiken of Vermont and Democrats Hubert H. Humphrey of Minnesota and Lister Hill of Alabama.

Walter Reuther, president of the United Automobile Workers, CIO, and James G. Patton, president of the National Farmers Union, put their own organizations on record as favoring the conference and a full-fledged political fight for public power this year.

Much of the impetus for the conference came from such publicly owned electric utility groups as American Public Power Association, National Rural Electric Cooperative Association, Tennesee Valley Public Power Association, and Northeastern Association of Electric Cooperatives. All were among the sponsors of the conference, as were CIO and AFL unions,

the Public Affairs Institute, the Farms Union, the Cooperative League.

Standing Committee Set Up . . . Nucleus of the new public power political action movement is to be a standing committee in Washington made up of representatives of the various sponsoring organizations. As presently outlined, this committee will have no set budget but will draw on the resources of the sponsoring organizations.

This committee is to "undertake all such activities, including calling of further general conferences, organization of regional conference committees, dissemination of information as the member organizations determine will advance consumer and national interests in the electric power field."

Mass Lobbying . . . At a final session attended by 200 delegates, the conference decided on a mass lobbying action in an effort to attain some immediate goals. As planned, each of the participating delegates was to call his representative and senators in an attempt to gain support for:

- Restoration of cuts made by the House for federal power projects.
- Confirmation of the reappointment of Chairman Thomas C. Buchanan as head of Federal Power Commission.

Buchanan's Voting Record . . . While the conference evidently backed Buchanan because of his reputation as a liberal, no explanation was given. It was not noted that he voted with the majority of the Federal Power Commission in granting licenses to electric companies for developments on the Roanoke River in North Carolina and Kings River in California. This record appears to run in direct conflict with Point 3 of the conference's statement of principles.

Threats of investigation flew hot and heavy during the two-day conference. No sooner had the delegates become comfortably seated than President Truman suggested he might have the Justice Department investigate publicity expenditures of electric companies to see if the companies violated the Corrupt Practices Act.

Justice Dept. Puzzled . . . This off-the-cuff remark had Justice Department lawyers in a tizzy. They couldn't figure out any way the act might apply to company spending as related to public power projects, since the act is limited in scope to expenditures for elections of candidates in primary and general elections.

An immediate response came from Congress, where Republican Rep George Dondero countered with a resolution to investigate the "self-styled" Electric Consumers Conference. The Michigan Congressman wanted a select committee to study the organization, its officers, delegates, and sponsoring groups to see whether they "are using their resources for un-American and subversive activities or for purposes not in the interest or traditions of the United States, and whether their activities are in violation of any law of the U. S. or the laws of any state."

Sides with Conference . . . But Democratic Rep John Rankin of Mississippi, one of the most vocal members of the Un-American Activities Committee, jumped into the fray on the side of the conference. He told delegates, "I will uphold the right of public power before any man . . ."

In its final policy statement, the conference called for a thorough investigation of private power companies and their advertising expenditures.

Although the conference tried its best to form a solid public power front, there were cracks in the wall:

- Though President Truman vigorously had given his backing to the fight against the electric companies, the conference was not sure he was doing everything he could to support federal power projects. In a last-minute floor action, the conference acted to send a special committee to the President to tell him to use his influence to get the St. Lawrence seaway and power bill before the Senate.
- In impromptu speeches, representatives of AFL and CIO strongly hinted that public power agencies would have to give organized labor a better deal if they expected full labor support.
- One delegate suggested that since the conference was supposedly made up of electric power customers of both public power and electric companies, it should give some constructive suggestion for service of electric companies. P. C. Spowart, an official of Seattle's City Light and a member of the conference's "committee on principles," replied: "It is my understanding that the purpose of this group is to develop public power. Let the private companies look after themselves."

FPC Schedules Hearings July 14 on Oxbow Project

Round two of this year's fight over hydroelectric development of the Snake River in Idaho is slated to begin at Baker, Ore., July 14 when a Federal Power Commission examiner opens hearings on the application of Idaho Power Co to build the Oxbow project.

The fight began in Washington in late March when the House Interior and Insular Affairs Committee held hearings on Interior Department's proposes to build the huge $356-million Hells Canyon project (EW, April 7, p 94). No committee decision has yet been made.

Oxbow, a $25-million, 140,000-kw project, is one of five projects which Idaho Power proposes as an alternative to Hells Canyon. Application for a license for this project has been pending before FPC for years, and hearings have been delayed presumably because the commission was waiting for Congress to act on Hells Canyon.

The hearings scheduled to commence at Baker July 14 and at Boise, Idaho, July 16, will be held to permit the introduction of views and evidence of a non-technical nature. The hearings will be continued in Washington "at the earliest practicable date" where expert and technical evidence of the Oxbow project will be received.

Metal Outlook Brighter for Civilian Producers

The materials situation is brighter now than at any time since the start of the Korean War. As a result, July-September allotments of steel, copper, and aluminum to manufacturers of civilian-type products will be higher than the previous quarter's metals rations, and restrictions on construction will be relaxed further on July 1.

Authorized metals consumption will still be far below pre-Korea levels, however.

Consumer goods producers will receive an average of 10% more steel, 15% more copper, and 50% more aluminum in the third quarter than they were allotted for April-June. They'll be getting 55% of the steel they used pre-Korea, 35% of copper brass mill and foundry products, 40% of copper wire mill products, and 45% of aluminum.

Let's *Look at* the "MK-40" *Contacts*

Thruout the entire range, from 400 to 5000 amperes and from 7.5 to 230-kv., the "MK-40" has many outstanding features, all essential to give better, smoother and easier operation. Most vital of these are the high pressure silver-to-copper contacts at both ends of the floating tubular blade—the simple and logical way to eliminate flexible shunts. Their design is of primary importance on an outdoor air switch exposed to year-round weather and corrosive atmospheric conditions. All parts are in plain view for visual inspection.

Plan view of 1200 ampere "MK-40".

Close-up showing multiple leaf pressure applying springs and separate current carrying contact shoes.

Arrangement of contact shoes and springs at hinge end is identical to the contact end.

Ask for Publication 4807

ONLY THE "MK-40" HAS ALL THESE FEATURES

1. Identical high pressure contacts at both ends of the blade are backed by sturdy beryllium alloy springs. Current carrying function is independent of the pressure applying members to take full advantage of the electrical and mechanical characteristics of the materials used.

2. Large spring deflection maintains constant contact pressure over a long period of years. There are no other springs or moving contact surfaces; no small parts.

3. Current interchange surfaces are reduced to an absolute minimum. Rolled or drawn sections are used. Hinge pins carry no current.

4. Contact material is a good heat conductor with ample volume to carry away heat generated under short circuit.

5. Metals at the point of contact are silver-to-copper to resist corrosion and abrasion.

Plus of course—smooth ease of operation with blade under full control at all times; locking in both opened or closed positions.

WHEN YOU WANT THE BEST IN HIGH VOLTAGE SWITCHES SPECIFY THE "MK-40"

DELTA-STAR ELECTRIC COMPANY
DIVISION OF H. K. PORTER COMPANY, INC.
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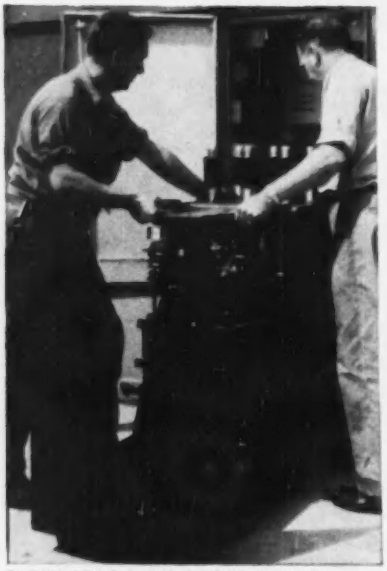


EASILY REMOVABLE CIRCUIT BREAKER facilitates inspection or replacement. This *vertical-lift* breaker cannot be moved in or out of operating position unless contacts are open.

AUTOMATIC G-E LOAD-RATIO-CONTROL unit eliminates separate voltage regulator. Control panel shown above has raise and lower push buttons, position indicator and operations counter. Some G-E LRC units have made over 1,000,000 tap changes without appreciable wear.

Utility finds quick answer to growing loads with G-E Packaged Substations

QUICK INSTALLATION: This G-E substation for the Western Massachusetts Electric Co. was trucked directly to site of installation, bolted to waiting foundation, connected to high-side and feeder cables, and placed in operation.

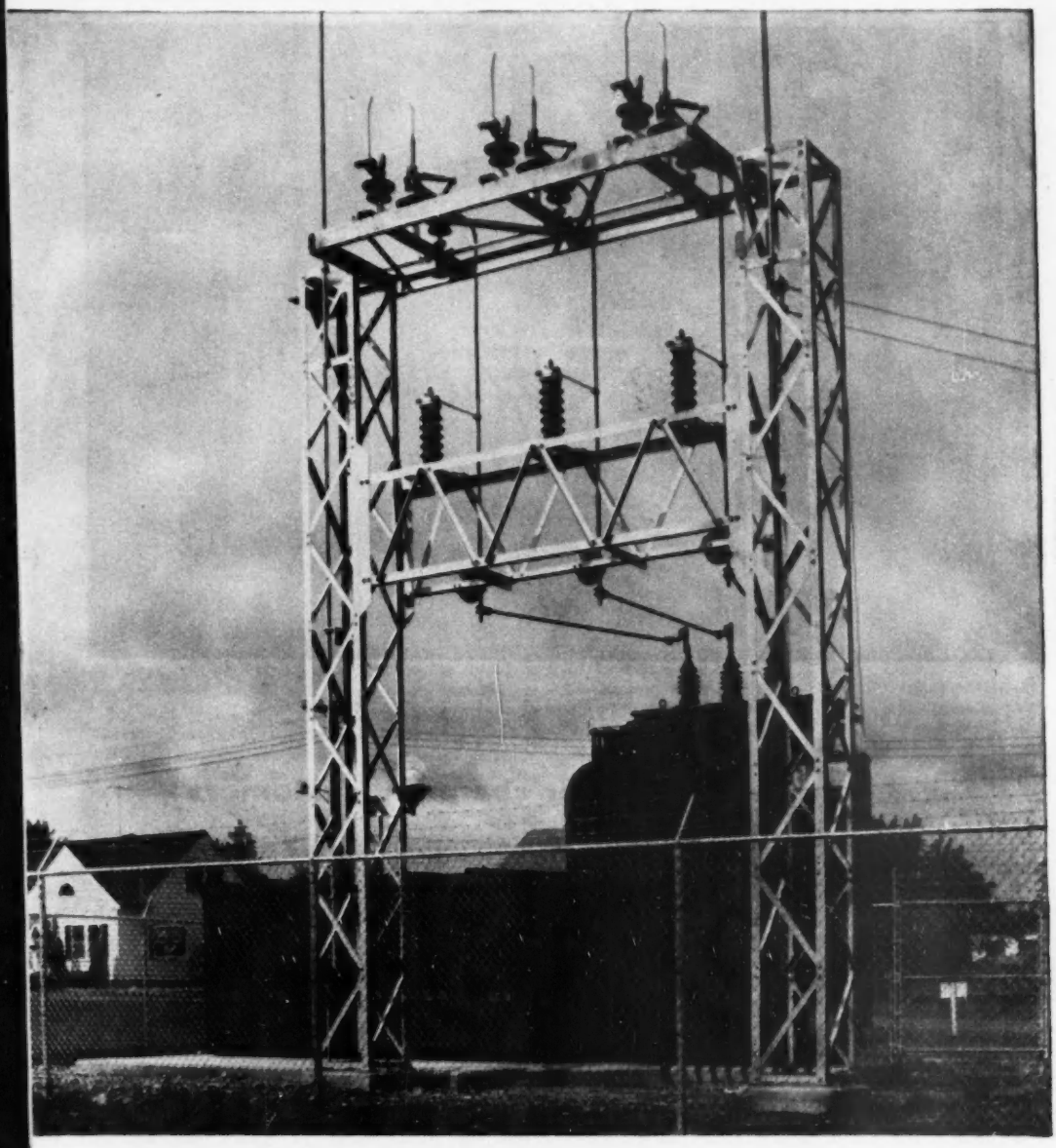
Standardized factory-assembled substations simplify utility expansion.

Faced with rapidly growing loads on one side of Pittsfield, Mass., the Western Massachusetts Electric Company found a ready answer when it ordered and installed the G-E unit substation shown at left. By selecting a standard unit directly from G-E specifications, it not only got quick delivery of a complete, ready-to-operate substation, but also saved time and money all along the line—from initial planning through to final installation.

When the need for further substation capacity developed on the opposite side of town, standardized equipment again was the answer—even to the necessary steel structure, as shown in the photograph on the opposite page.

The trend to standardized equipment, as the logical cost-saving way to meet growing loads, is evident in utility expansion programs across the country. Because of their great flexibility, G-E unit substations are applicable to a wide variety of system arrangements. For full information, write for Bulletins GEA-3800 and GEA-4500. *General Electric Co., Schenectady 5, N.Y.*

321-70



EVERYTHING STANDARD—INCLUDING THE STRUCTURE: One of the latest substations installed by the Western Massachusetts Electric Company, this unit was supplied complete, even to the steel structure for the incoming high-voltage lines. Standardized equipment like this eliminates weeks of detailed planning and engineering, simplifies purchasing. Trained engineering personnel have more time for the important work of broad system planning. The trend is to "standards"!

GENERAL ELECTRIC

Sangamo J Meters

make friends of power company customers

Outdoor metering has brought about a big improvement in company-consumer relations. It has eliminated annoyance to the consumer and has reduced expense for the power company.

Outdoor metering is no problem with Sangamo J Meters. They are fully compensated for all temperature extremes and accurately measure all power delivered at sub-zero or torrid temperatures. They are designed to maintain the proper physical relationships of all parts under all conditions of changing temperatures and vibration.

J Meters are quiet in operation even under the most adverse conditions.

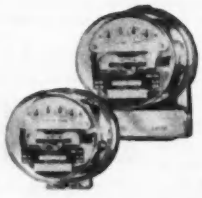
J Meters are accurate. Not one case has been reported of a Sangamo J Meter speeding up in service due to loss in damping strength. Since the damping magnets control the speed of the meter, accuracy depends upon the permanence of their strength. Because the alnico damping magnets, used in J Meters, are unaffected by extreme operating conditions, they completely eliminate over-registration with resultant "high bill" complaints.

Only Measured Facts are Known Facts

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

SM52-7

Sangamo J Meters have proved their ability to meet today's requirements and tomorrow's anticipated loads with sustained accuracy, economy of maintenance and troublefree performance.



MEETING REPORT

Gas Recirculation Discussed . . .

. . . as means of steam temperature control at meeting of Pennsylvania Electric Association's Prime Movers Committee

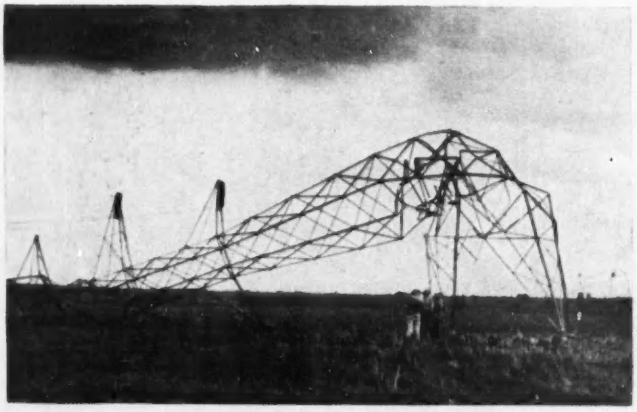
Gas recirculation for steam temperature control is a feature of more than 100 boilers in service or on order. This was a statement of P. R. Loughin, Babcock & Wilcox Co, at a meeting of the Prime Movers Committee of the Pennsylvania Electric Association in Easton, Md., on May 28.

It was at the Vienna plant of the Eastern Shore Public Service Co that the modern version of gas recirculation was initiated as a supplementary or alternative means of controlling superheat and more recently reheat temperature. R. M. Mullen of the local utility demonstrated by charts the fine control obtainable on the Vienna units and added that troubles were definitely of a minor nature and that fan blade erosion had been negligible. It was considered a wholly successful innovation.

Complications . . . High temperatures, reheat and gas recirculation had greatly complicated the problem of automatic control of superheat temperature said P. S. Dickey, Bailey Meter Co. More than half the heat put into the steam is now in the superheating at 1050 and 1100 F. This, with the correspondingly increased mass of metal in the superheater section, introduces time lags (up to 6 minutes) in response and this delay must be circumvented in the controls. As a result the controls have been shifted to gas-flow and steam-flow with a temperature differential added in case of gas-recirculation. Bailey controls have been furnished for the temperature regulation of over 400 boilers in the last 15 years.

Loughin, in reviewing the evolution of the cyclone furnace, stated there are now 18 such units in commercial operation totaling 10 million lb per hr. Thirteen more are being built to an added total of 10 million lb. Earlier developmental problems have thus largely been solved for use of a widening variety of coals. Nor would he acknowledge any limitation to natural circulation even as pressures approximating the critical are approached. Such units for high pressure operation since 1937 amount to 65 with an average size of practically 1 million lb per hr. Fourteen units are in operation and 56 more are in the offing.

Two methods are commonly employed to control superheat and a third is frequently added for reheat control said E. D. Scutt, Leeds & Northrup Co. He added that temperature control has become at least as complex as combustion control. After discussing six basic methods he focussed on a composite system which affords proportional action (for temperature deviation), reset (to inject a rate of restoration), and rate action (responsive to temperature rate). Each is accomplished by setting respective rheostats in the electronic system Detection lag is minimized by employment of a high-speed thermocouple.



Wind Topples Towers in Utah

Gusts of winds that ranged as high as 97 mph toppled 13 transmission towers near Williard in Utah's Box Elder County last month.

The double-circuit, 130-kv line is a vital link between Salt Lake City and Utah P&L's 125,000 kw Bear River system and the Northwest Power Pool.

Power from the Bear River (Idaho) plants was rerouted and service restored within 5 hours.

More Aluminum Is Seen Available for Distribution

For electric distribution the aluminum products situation will improve to a greater extent than the copper situation in the very near future J. W. Mullally, manager of utility sales, Anaconda Wire & Cable Co, declared at spring meeting of Pennsylvania Electric Association.

Mullally stated that it is necessary "to face the question of aluminum application and solve this question by (1) honest, well-directed research, (2) sound engineering, and (3) economic studies."

Henry Wengen, sales manager, Fargo Manufacturing Co, stated that for aluminum-copper conductors, a connector should have a spacer for use between the two conductors. Also for the aluminum contact areas it is good practice to have dual plating—a layer of zinc next to the copper or bronze body and then a layer of tin.

Neoprene cables used in substations are being laid in sand or clay and corrugated transite put on top of cable rather than burying in pebbles as in earlier installations, said P. M. Hess, Pennsylvania Water & Power Co.

Low-voltage rubber-covered cable which burns open in a duct, according to R. P. Brotzman, Philadelphia Electric Co, is pulled from both ends and the duct is found to be clean.

Illustrated: Moloney Power Transformer FOW (forced oil cooled, with forced water cooled heat exchangers.) The transformer is rated 60,000 Kva with a high voltage of 230,000 GrdY and a low voltage of 13,600.

RICITY

WITH all our progress in this, the 20th Century, we still have no completely satisfactory explanation of what electricity is. Yet . . . we know that electricity has changed the pattern of the world.

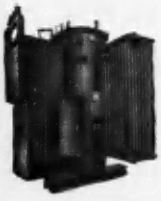
Here is this tremendous force, which we can't explain but can control by flicking a switch, in use everywhere, constantly sustaining the industry and life of this nation and the world. Experience, engineering and research have done much to permit the efficient use of this power. Utilities everywhere have come to recognize the importance of Moloney Equipment in transmitting and distributing electrical energy *so economically* and *so dependably.*

ME52-10

MOLONEY ELECTRIC COMPANY

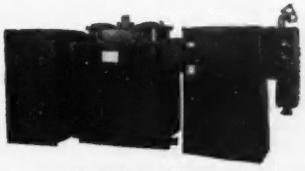
Manufacturers of Power Transformers • Distribution Transformers • Load Ratio Control Transformers • Step Voltage Regulators • Unit Substations

SALES OFFICES IN ALL PRINCIPAL CITIES
FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA



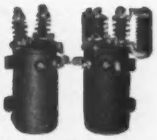
Load Ratio Control Transformers

Feeder Voltage Regulators and Regulating Transformers

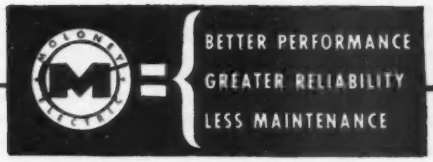


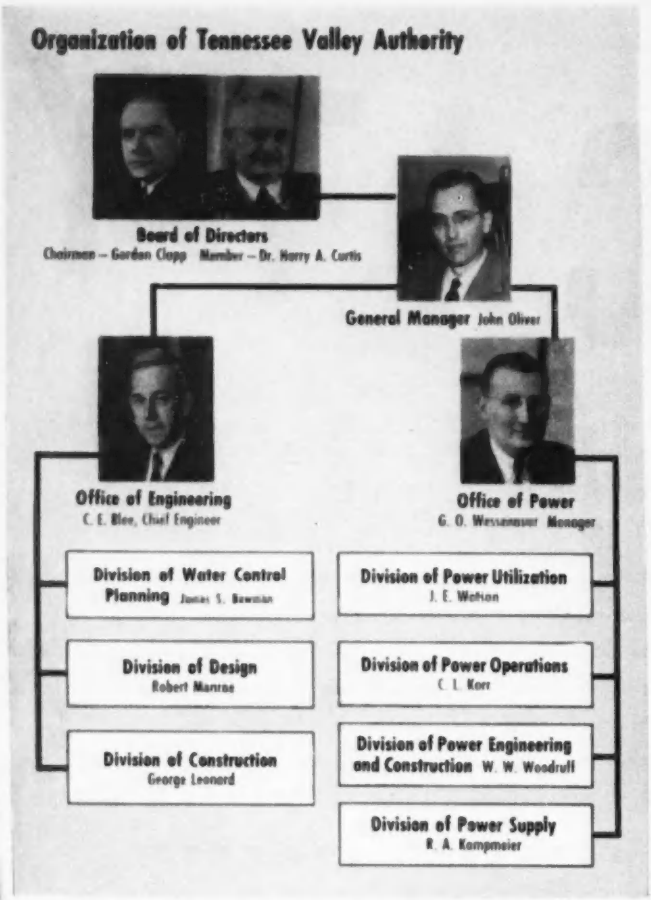
Load Center Unit Substations

Network Transformers



HiperCore Distribution Transformers




Organization of Tennessee Valley Authority
Board of Directors
Chairman – Gordon Clapp Member – Dr. Harry A. Curtis
General Manager John Oliver
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Office of Power
G. O. Wessenauer Manager
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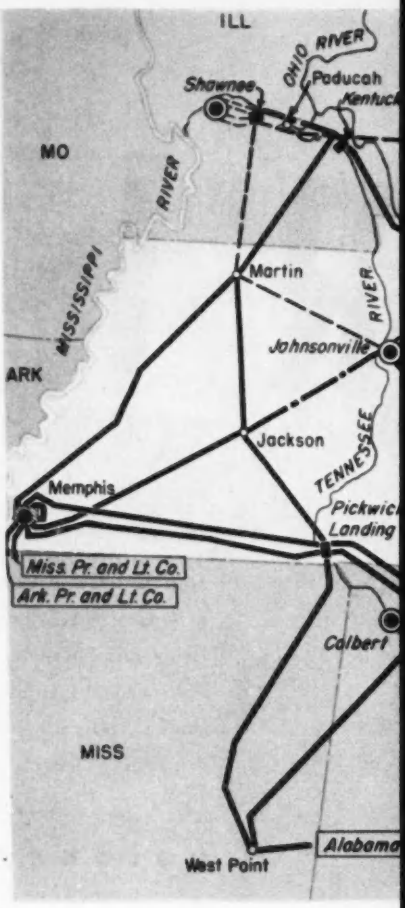
Division of Power Engineering and Construction W. W. Woodruff
Division of Power Supply R. A. Kompmeier



MANAGEMENT OF TVA is in the hands of a board of directors. For a year there has been one vacancy. This chart shows those who direct power operations, only one of TVA's activities

TVA Planning 8.1-Million-Kw Capacity

Growing AEC and industrial loads force authority to erect steam plants to meet requirements. Rates will rise for large power users

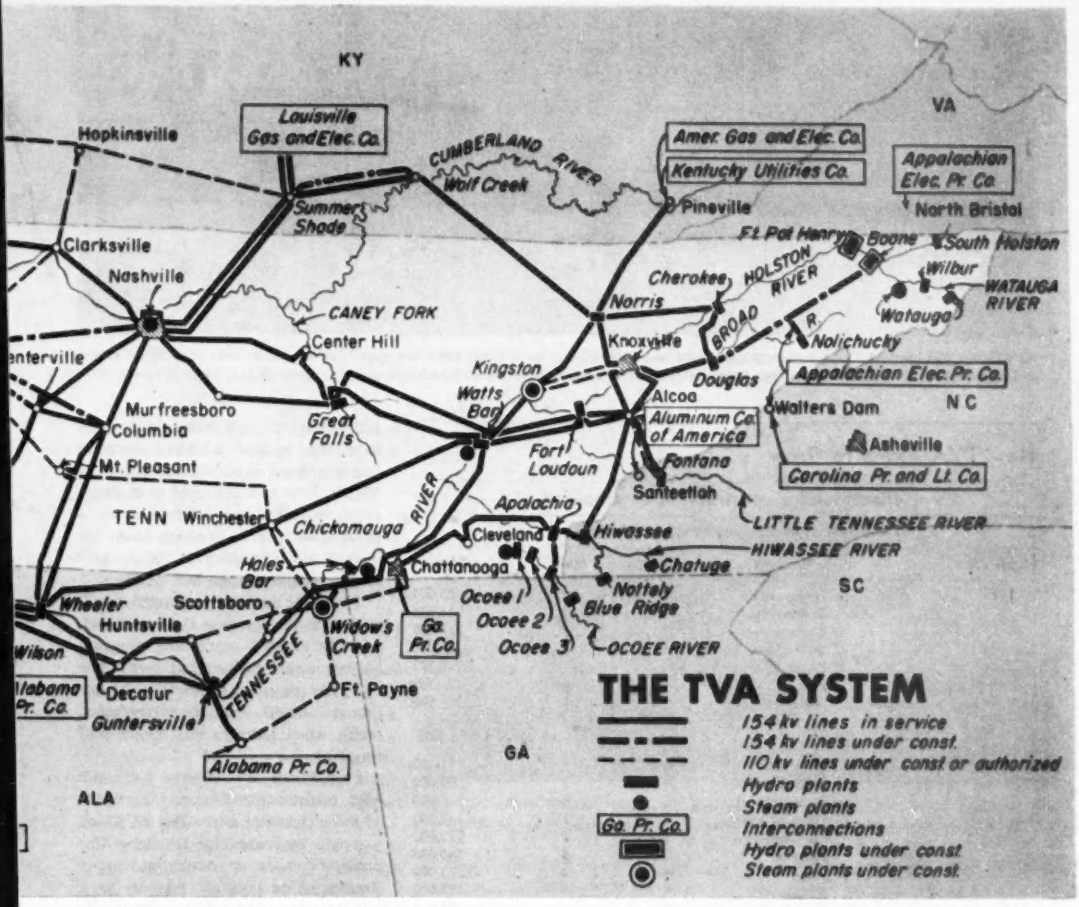
Tennessee Valley Authority has stricken the word "abundant" from its slogan, "cheap, abundant electricity." Back in the late "thirties" there was some basis for the slogan. Now all has changed. From the load standpoint as well as in a number of other respects TVA is in the same boat as most other power suppliers in the nation.

TVA no longer builds projects and invites industries to "come and get" the power. Instead it is trying to predict where loads will be and is doing its best to meet them.

Main reason for this problem is that originally TVA was a hydro system. Now all choice hydro sites have been exploited. When work presently planned is completed, there will not be a vacant stall in any of TVA's 29 hydro plants. TVA is rapidly becoming a steam system. By 1955 two thirds of its installed capacity will be steam.

Right now the authority is searching for new steam plant sites. Their selection will depend on load patterns as well as fuel costs. Naturally most of these sites will be along rivers because such sites cut fuel transportation costs and provide abundant cooling water.

The present construction program astonishes even the old TVAers. In the next three and a half years system generating capacity is scheduled to double. On June 30, 1952, installed capacity will be 4 million kw. By Dec. 31, 1955, it is scheduled to be



TVA NOT ONLY DOMINATES Tennessee but makes its presence felt in all adjoining states. The system is well integrated, but short distances between plants and load make it possible to transmit power at comparatively low voltages. Map shows location of system plants

to Supply Its Rapidly Soaring Peaks

8.1 million kw, largest in the United States. Of course, Congress must be willing to supply the funds, but in the past it always has.

Three of the large steam plants now under construction, or at which new units are being added, are near replicas of each other. They are the 675,000-kw Widows Creek and Shawnee Plants and the Johnsonville Plant rated at 540,000-kw. The 900,000-kw Kingston and the 720,000-kw Colbert Plants will include improvements over plants now in advanced stages of construction. The Colbert Plant may have 200,000-kw, single-shaft turbo-generators.

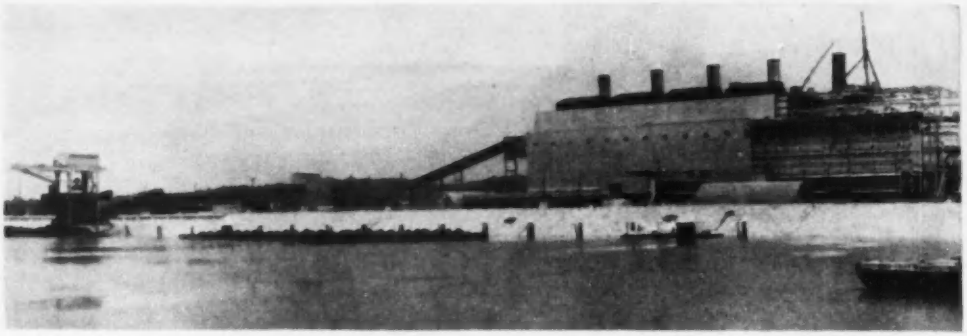
At the existing 64,000-kva Hiwassee project in North Carolina pumped storage is being considered. Under this arrangement water would be pumped from below the dam in off-peak periods so that it could be used to generate power in peak periods.

At the 40-year old Hales Bar Dam a part has been sliced off to provide room for two additional 50,000-kw units. These will more than double plant capacity. The 14 units still operating were installed long before TVA days.

Compared with generation expansion transmission additions will be small. TVA transmission is essentially at 154 kv. There are some 110, 66, and 44-kv circuits. Higher voltages, because of short distances, will not be required for the internal transmission system. Perhaps later higher voltage lines will be required for interties.

An extensive transmission system has been developed to bring power from the concentrated hydro facilities in the east to loads elsewhere in the system. Special lines have also been built to serve Atomic Energy Commission load at Paducah, Ky. These will serve as a feedback for any power developed at Shawnee in excess of AEC loads.

Despite its expansion program TVA



JOHNSONVILLE, first of TVA's modern steam plants, was authorized by Congress only after a bitter fight that lasted several years. Basis for the opposition was that TVA was set up only to generate energy from the water resources of the region. But as usual TVA was victor

How TVA Plans to Grow

Plants under construction or proposed

Capacity as of Dec. 31, 1951, 3,541,110 kw

Fiscal Year	Projects	Fuel	Units	Capacity
1952	Johnsonville	S	2	225,000
	Guntersville	H	1	24,300
	Chickamauga	H	1	27,000
	Wolf Creek	H	1	45,000
	Cedar Cliff	H	1	6,375
	Hales	H	1	24,300
	Widows Creek	S	1	112,500
				4,005,585
1953	Hales Bar	H	1	24,300
	Wolf Creek	H	2	90,000
	Widows Creek	S	3	337,500
	Pickwick Landing	H	2	72,000
	Johnsonville	S	2	225,000
	Shawnee	S	4	540,000
	Boone	H	3	75,000
	Kingston	S	1	135,000
	Dale Hollow	H	1	18,000
	Bear Creek (Alcoa)	H	1	9,000
	Cherokee	H	1	30,000
				5,561,385
1954	Kingston	S	3	405,000
	Widows Creek	S	2	225,000
	Cherokee	H	1	30,000
	Fontana	H	1	67,500
	Ft. Patrick Henry	H	2	36,000
	Douglas	H	1	26,000
				6,350,885
1955	Colbert	S	4	720,000
	Shawnee	S	2	270,000
	Old Hickory	H	3	75,000
				7,415,885
Dec. 31, 1955	Shawnee	S	2	270,000
	Kingston	S	2	360,000
	Hiwassee	H	1	57,600
	Chatuge	H	1	10,000
	Nottely	H	1	14,000
	Old Hickory	H	1	25,000
				8,152,485

gets no special relief from the problems faced by other utilities. The main one is to meet in-service dates. As of May 1 TVA had managed to meet all of them. But top officials have a gloomy outlook on meeting them for the remainder of the year. "Slippages" seem probable by the last quarter.

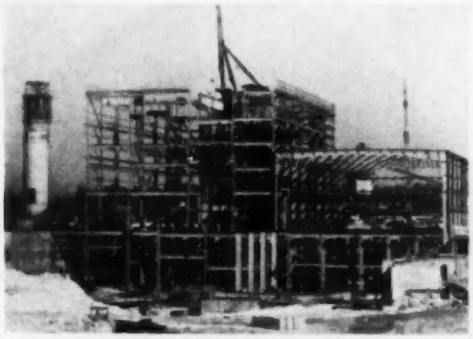
TVA's steam plant construction will push it to the top as a U.S. coal user. Already its coal purchasing program has come in for sharp criticism. The controversial point is whether the authority should require performance bonds when letting contracts to coal suppliers.

Such bonds are required for some 85% of the contracts covering periods of more than one year. But TVA felt it would be reasonable to shelve this policy to open up new coal supply sources. One contract was let to a supplier who was willing to gamble that he could profitably develop nearby coal seams and offer coal at lower cost than would otherwise be available.

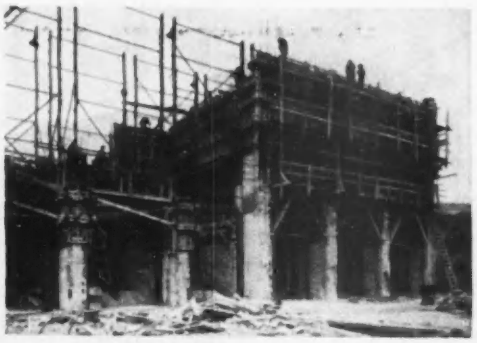
By not requiring a performance bond TVA is participating in the gamble on the theory that new problems demand new approaches. Performance bonds are required on contracts for such equipment as boilers, turbines, and generators.

By going to steam generation TVA will have to raise its rates. But the industrial users will pay most of the increase. Says Gordon Clapp, TVA board chairman, "We see no set of circumstances in the foreseeable future that would make it necessary to increase rates for the small power consumer." His view is that steam plants are really being built to serve the high load factor user; so they may as well pick up the tab.

Accordingly TVA distributors are



SHAWNEE STEAM PLANT is being rushed. Even its 540,000 kw in four units won't be enough to supply demand of AEC's Paducah plant



KINGSTON STEAM PLANT is to have an ultimate capacity of 900,000 kw. The first 135,000-kw unit is scheduled for operation in fiscal 1953

now renegotiating contracts with large power users—in excess of 500,000 kwhr a month—to bring about a general rate increase.

The revision will be based on:

1. A direct increase on energy used in excess of 500,000 kwhr a month from 50 to 75 mills per kwhr.

2. Uniform demand charges.

3. A fuel escalator clause in all new contracts.

TVA believes its new industrial rates will raise revenues about 1%. But industrial users will pay 4% more.

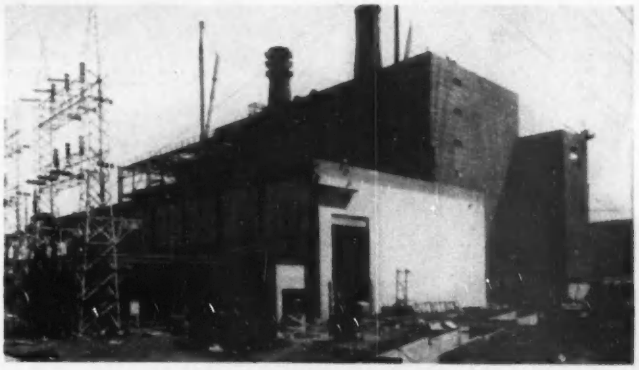
Roughly it will mean an increase of about $1 million a year in revenue to TVA distributors such as municipals and cooperatives. About 75% of that will be passed on to TVA.

System peak loads have been growing rapidly. In July 1945 peak was 1.7 million kw. Last winter it was 3.9 million kw. By 1955 a peak of 7.1 million kw is expected. Unannounced expansion of Atomic Energy Commission facilities in the area could drive the 7.1 million peak even higher.

TVA claims to have one of the highest load factors of any large system, 72% in fiscal 1951. One of the main reasons for this is the AEC load which takes about 22% of TVA's output. This will jump to nearly 30% when AEC projects are completed.

Aluminum and other metallurgical plants—all high load factor customers—also have improved the system load factor.

Some 7% of TVA power users live in electrically heated homes. In some sections of the service area this has shifted the daily peak from afternoon to morning. As air conditioning comes into wider use, TVA expects it will balance space heating and further improve the annual load factor.



WIDOWS CREEK STEAM PLANT will soon have its first 112,500-kw unit in operation. But TVA plans to add three more in fiscal 1953 and two more in 1954 for a capacity of 675,000 kw

While it is TVA's power plants and dams that get nationwide publicity, its transmission system is equally important. TVA serves only 600 customers at retail. It wholesales to about 150 customers about two thirds of municipal systems and a third cooperatives. In fiscal 1951 it had 3,168.59 miles of line 110 kv and higher. Operation costs were $142,99 and maintenance costs $65.01 per mile. In the same period for the 4,141.02 miles of 66-kv and lower voltage lines operation costs were $83.37 and maintenance costs $91.15.

Goal of TVA's Division of Power Operation is to reduce the cost for both operation and maintenance to $100 per mile. The division is banking on the discovery of new techniques to make this possible.

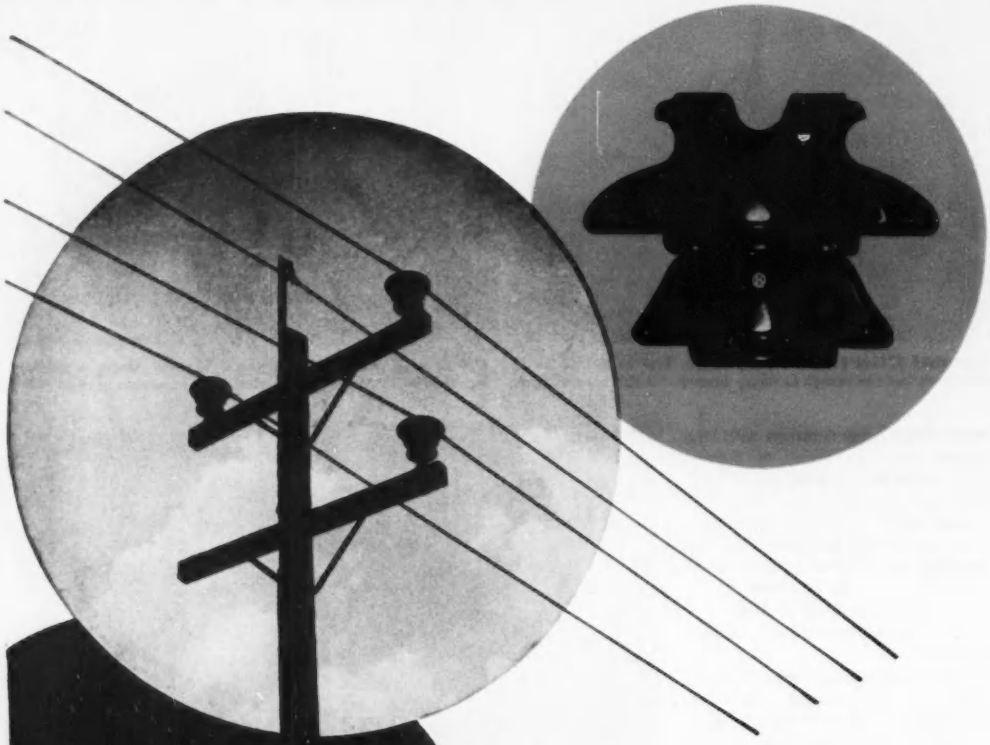
At present the system is using every known technique. Before the end of the year it expects to have its microwave network for communication and dispatching in operation.

Beyond community limits TVA is using rigid-wing planes and heliocopters for line patrol. Cost of air patrolling is $1.75 a mile, of foot patrolling $4.50. The former is much faster.

Chemical clearing of rights-of-way is being used. Farmers are encouraged to cultivate the rights-of-way after they are cleared. And TVA pays crop damages caused by its crews, believing the cost is less than clearing.

Rapid system growth has prompted a sharp rise in circuit breaker capacities. Recently the largest were 3.5 million kva. Breakers now being bought are in the 10-million-kva class at 154 kv. TVA also is modernizing the smaller breakers raising the 2.5 and 3.5-million-kva breakers to 7.5-million kva.

Heavy duty conditions are bringing difficulties with disconnect switches. Some consideration is being given to eliminating them at points where the duty is beyond the capability of available equipment.



WHEN YOUR LINE MUST

stay on the job

. . . . . Consider These Facts

Let's look at some *facts* on pintype insulator performance. This line was energized in 1917 at 44 kv, using 55-kv O-B pintypes. In 1920, voltage was raised to 69 kv on the same insulators. For 31 years the insulation has been living on part of its safety factor . . . The territory through which this line passes has an official 30-year average of 46.2 annual storm days. In the last five years, the first two of the 1,300 O-B pintypes have been replaced due to deterioration, although neither caused an interruption. Today, the line still handles an important industrial load . . . Thirty-four years of insulator service; 31 of which over-loaded -- more than 46 annual storm days -- only two replacements in 1,300 when the line was 29 years old, and these not causing an outage -- *facts* such as these point to the soundness of specifying O-B pintypes for lines that must stay on the job!

Ohio Brass

MANSFIELD • OHIO

4188-M

HELICOPTER used for line patrolling saves time and money. By using a dictaphone the observer never need take his eyes from power lines

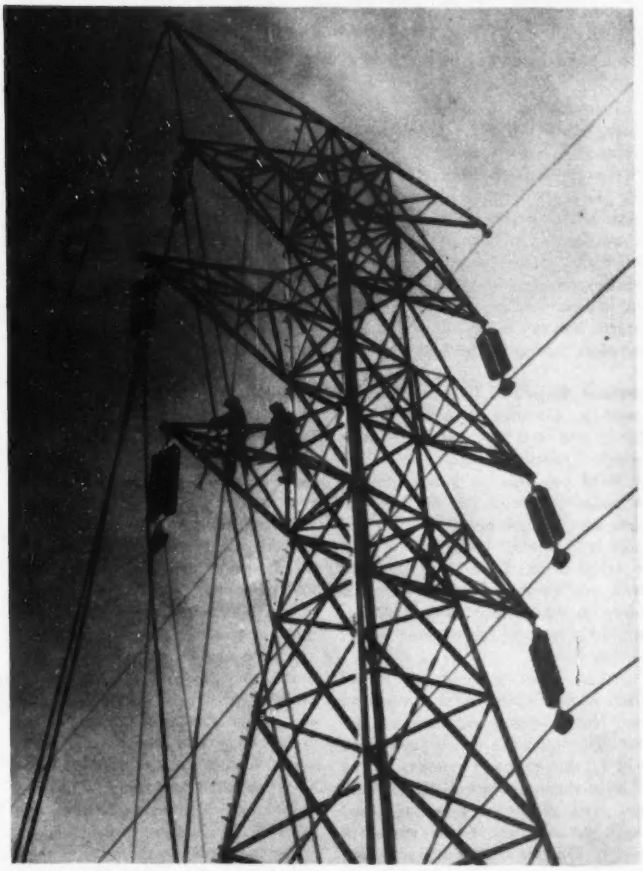
ROYALTY GETS A HEARTY WELCOME from Chairman Clapp, center. Royal personages are Queen Juliana of Holland and husband, right

The country's only river basin authority can probably claim more visitors than any other power operation. Thousands of persons make use of its recreational facilities which go hand-in-hand with many of the lakes behind its dams. Hundreds of foreign visitors also visit TVA installations.

Economic Outlook . . . But even with the worldwide attention that it has gained, TVA policy makers are not content with the present accomplishments of the authority. They look to the future as a continuing period of development of the valley economy. While admitting this economy will depend largely on national and internaational developments, they believe special circumstances make the outlook for the valley and the whole South particularly bright. First among these is that the foundation has been laid for sound, diversified industrial activity.

If there is any thought of a coming depression, it is not openly expressed by TVA officials. They talk and act and plan as though the brightest days are still ahead.

A Federal Network? . . . No consideration is being given to an intertie with other federal power systems, TVA Chairman Clapp said recently. But as the service area of Southeastern Power Administration expands westward and the Missouri River Basin and Southwestern Power Administration systems expand eastward, there is the possibility of spreading the federal power network.



CONSTRUCTION of a 161-kv transmission line from Widows Creek Plant takes two workers high into the air. Favorable locations of power plants has reduced transmission problems

FRIENDLY CHAT at Conference on Nuclear Energy is carried on by (left to right) D. H. Loughridge and T. K. Glennan, AEC; and J. H. Harlow and S. M. Arrow, Philadelphia Electric Co

Industry Role in Atom Program

AEC Commission Glennan outlines steps private companies can take to assist in nuclear energy development

Industrial development of atomic energy, like any other industrial development, must eventually be made the business of risk-taking industry, T. Keith Glennan, commissioner, Atomic Energy Commission, told the Conference on Nuclear Energy at Michigan State College May 20-21. However, unless industry does more in atomic energy development the atomic industry will continue as a government monopoly, he said.

Outlines Steps . . . It is an expensive business, Glennan declared, but he listed first and less expensive steps which industry can take:

- Read literature on atomic energy.
- Assign one member of the organization who is interested to do this and keep management posted.
- Assign a man for a period of work with one of the electrical manufacturers in the nuclear energy field.
- Send a man to the Reactor School at Oak Ridge.

Asked about prospects of power from nuclear energy on a competitive cost basis, Glennan expressed the belief that within five to ten years there will be one or more reactors in the U.S. producing power on an economical basis in certain locations. Fuel costs, he said, will be an important factor. For this reason, atomic power may prove attractive, economically, in under-developed countries first.

Atomic Power . . . Extension of the Dow Chemical-Detroit Edison Co agreement for continued atomic research Glennan said was most encouraging and it indicated that there was real hope for the economical development of power from nuclear sources.

S. H. Schurr, chief economist, U. S. Bureau of Mines, analyzed the prospects of power from atomic energy and concluded that even when it arrives it will not bring about any revolutionary effects in the economy of the nation.

However, he called attention to the prediction made by Commissioner Glennan that power from nuclear energy would be available in five to ten years and indicated that many policy matters would have to be decided well in advance of that time and said that was particularly true of the question of whether such power would be government power or would be developed and produced by risk capital.

Describing industrial applications of radioactive istopes, D. M. McCutcheon, applied research physicist, Ford Motor Co, said they lend themselves to continuous testing. They have been used for locating thin spots in boiler tubes, superheater tubes and the like, for locating obstructions in piping and pneumatic tube systems and in the testing of engine performance.

Nielsen Method . . .

. . . of resuscitation wins approval of EEI group as supplement to other techniques

Edison Electric Institute's Accident Prevention Committee has put its stamp of approval on the back-pressure arm-lift (Holger-Nielsen) method of artificial respiration.

At a meeting at Indianapolis last month the committee approved a recommendation from a group of medical advisors that this method be adopted by utilities as a supplement to the prone pressure (Schafer) and pole-top (Osterreich) methods. Each method, it was recommended, should be applied in keeping with the location of other bodily injuries possibly incurred with the electric shock.

Research Subcommittee . . . Committee Chairman W. F. Brown was authorized to establish a subcommittee to spell out for the EEI board the details of a program also recommended by the medical advising group that research be made into all aspects of the effect of electrical current on living organisms. This lies outside the defined scope of the already authorized research into the practicability of applying defibrillating current to snap the victim's heart out of ventricular fibrillation.

Prof W. B. Kouwenhoven, who is carrying out this mission with doctors at the Johns Hopkins University, reported that 50% of the tests on dogs had been successful on application of external discharge of a 50 mf capacitor charged at 3,000 v. Two-thirds of remaining trials were successful upon use of 400-v 60-cycle shock.

Statistics tentatively compiled for 1951 show that 222 companies with 302,377 employees and 623,816,924 man-hours had 155 fatalities, 4 permanent total disabilities, 275 permanent partials, and 6,902 lost-time accidents. Total scored days lost was 1,245,320. This is slightly better than 1950 as to frequency rate (11.06) and slightly worse as to severity (2.00).

Industrial demand for compact and less expensive switchgear, said H. L. R. Kurth, Boston, is resulting in insulation values and clearances inadequate according to utility standards based on work safety.

MAGNET WIRE

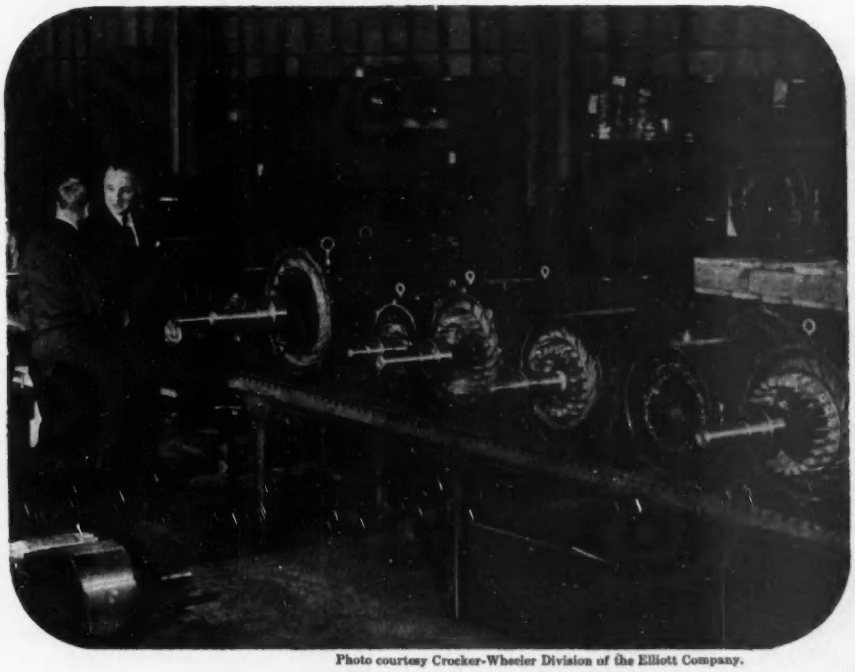


Photo courtesy Crocker-Wheeler Division of the Elliott Company.

Roevar...you can't buy a finer magnet wire

CONTINUAL IMPROVEMENT is a distinguishing feature of Roebling's electrical wire and cable line. And to make Roebling Roevar Magnet Wire today's A-1 specification for high speed winding, we use the toughest insulation we know of.

This Roevar insulation is *many times* more abrasion-resistant than conventional enamels. It is highly resilient . . . bends to a remarkable degree without cracking or coming loose from the conductor. On top of that, it has extra resistance to the solvents that are used in coil-treating varnishes and to all usual baking temperatures.

Roevar Magnet Wire comes in sizes No. 14 to 40 A.W.G. . . . and its small diameter is an important factor in many applications. You can depend on us for the best deliveries possible under today's conditions. John A. Roebling's Sons Company, Trenton 2, N. J.

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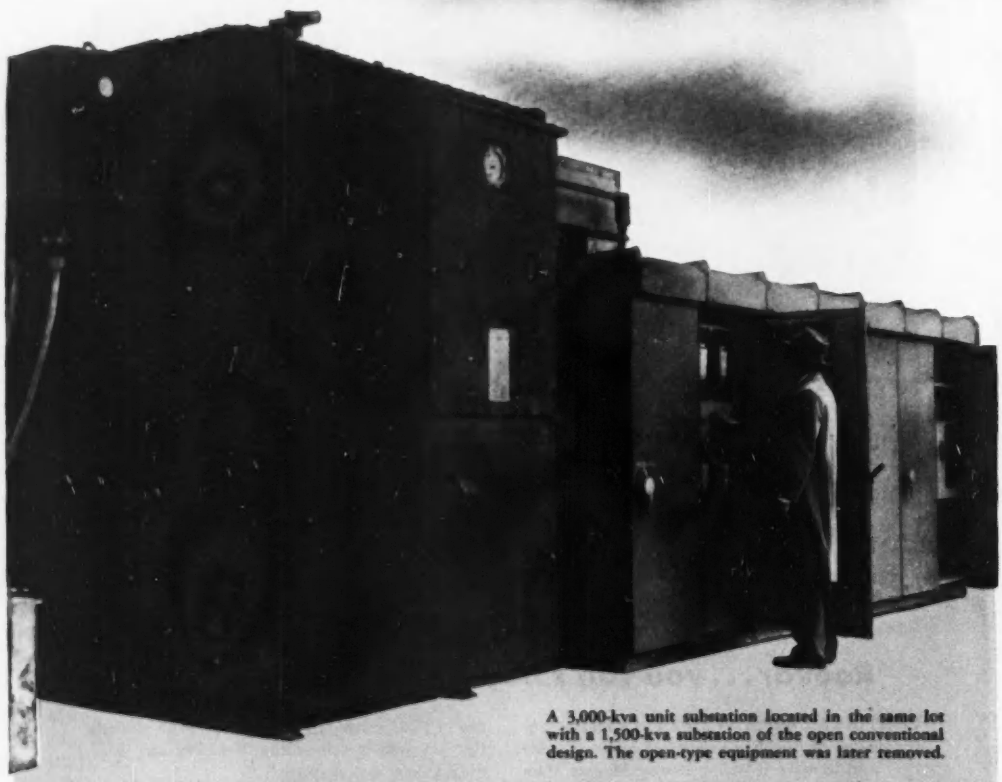
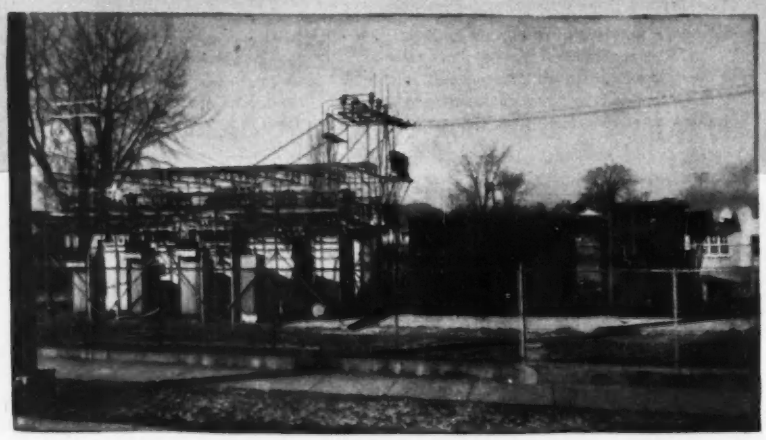
ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 701 ST. CLAIR AVE., N. E. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURG 1301 CLARK BLDG. • SAN FRANCISCO, 1740, 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY



A 3,000-kva unit substation located in the same lot with a 1,500-kva substation of the open conventional design. The open-type equipment was later removed.



Midwest utility modernizes system, solves load problem

WITH WESTINGHOUSE UNIT SUBSTATIONS

The experience of Iowa-Illinois Gas & Electric Company with unit-type substations will interest progressive system planners. It suggests a way to attain this important objective: *a simplified flexible system providing long-range operating economies.*

"Load growth in our area made it imperative for us to modernize our distribution system. After considerable study it was decided to use factory-built, unit-type substations.

"Westinghouse Unit Substations of co-ordinated unit design met our requirements . . . maintenance has been very slight . . . location of the substations close to the load center keeps losses to a low value and provides for better regulation. Future expansion is simply and economically handled by adding unit substations in areas of maximum load growth —or by moving a substation in its entirety, if load shifts, thereby salvaging the bulk of the investment."

Iowa-Illinois Gas & Electric enjoys these benefits because Westinghouse Unit Substations are specifically designed to meet today's power distribution problems. Unitized construction simplifies expansion to accommodate increased load requirements. Individual feeder regulation can often be eliminated and Westinghouse Unit Substations offer these same advantages to you.

For complete information, get your copy of Booklet B-4061. Ask your Westinghouse Representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60779

YOU CAN BE SURE...IF IT'S
Westinghouse

UNIT SUBSTATIONS

"There are Good Metallurgical and Design Reasons for the Low Exciting Current and Low Core Loss of the POLE STAR,"

says Clarence J. Witsberger, *Electrical and Metallurgical Engineer*
PENNSYLVANIA TRANSFORMER COMPANY
Member ASTM Committee A6 on Magnetic Properties

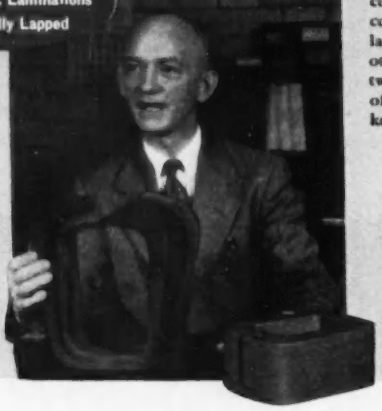
Modern distribution transformers are fabricated of preferred oriented grades of cold reduced silicon steels. It is desirable therefore to take full advantage of the high permeability and low loss characteristics of this fine grade steel. This is accomplished in the Pole Star core design.

Laminations individually lapped in Pole Star core

Magnetic Circuit of Epstein Test. Laminations Individually Lapped

Low Reluctance at Lap Joint Results in Low Exciting Current

A minimum reluctance at the joint of the Pole Star Core is achieved by lapping the individual laminations. This is the same type of lap joint used in the magnetic circuit of the latest approved method for testing the permeability of preferred oriented cold reduced silicon steels. This test is known as the 25 cm. Epstein Test for core loss and permeability. The Pole Star core achieves a low exciting current by combining High Permeability Steel with a low reluctance joint.



Absence of Adhesions in Core Results in Low Core Loss

The core is carefully annealed in controlled-atmosphere furnaces, but does not suffer the disadvantages of adhesions. That is because in the core assembly process—when the core is built into the coils—the laminations are separated from each other. The absence of adhesions between laminations and the presence of high interlamination resistance keeps the core loss at a low value.

Pennsylvania
TRANSFORMER COMPANY
CANONSBURG, PENNSYLVANIA
Greater Pittsburgh District

Gerald Williamson Is Advanced

Union Electric promotes veteran employee to superintendent of power production. Howell is elevated

G. V. WILLIAMSON

Gerald V. Williamson has been promoted to superintendent of power production at Union Electric Co of Missouri. The utility also advanced Albert W. Howell to superintendent of hydro and steam operations. Williamson has been superintendent of the Steam Engineering Division and Howell has served as power supervisor.

Studied in Europe . . . Williamson, a graduate of Washington University with a bachelor of science degree in mechanical engineering, was first employed by Union Electric in 1922 as an engineer. After taking a year's leave of absence to study power plant design and operation in Europe, he returned to Union Electric in 1926 as assistant to the chief engineer of power plants, a position he held until his promotion to superintendent of steam engineering of the utility in 1944.

In 1951 Williamson was elected chairman of the Prime Movers Committee of Edison Electric Institute for the 1951-1953 term. The new power production superintendent recently returned from Great Britain, where he was one of 17 American utility experts who toured British power plants (EW June 2, p 75).

Howell, who graduated from the University of Illinois with a bachelor of science degree in electrical engineering in 1928, came to work for Union Electric that same year. He started in electrolysis and radio interference work in the distribution department, advancing to the post of power supervisor of the utility in 1944.

S. Paul Vecker, a vice president of Carolina Power & Light Co, has been placed in charge of the utility's industrial and agricultural development and, in addition, will assist the president from time to time in special assignments. **Hugh G. Isley,** general sales manager, has been placed in full charge of the sales department and its activities and will report direct to the president. Vecker joined Carolina P&L in 1935 as general sales manager. Isley has been connected with the utility since 1919.

Donald J. Sterling has joined Pacific Power & Light Co as public affairs consultant. Sterling, who has spent 43 years in newspaper work, retired last March after 33 years as managing editor of the "Oregon Journal."

Walter Brenton, assistant general superintendent of Portland General Electric Co, has been named general superintendent. Brenton, who became chief engineer for PGE in 1929, succeeds **J. C. Henkle** who has retired after 43 years' of service. Henkle was made general superintendent in 1946.

James R. Weaver has been appointed assistant to the vice president in charge of manufacturing for Westinghouse Electric Corp and will be located at Pittsburgh, Pa. For the past four years Weaver has been on assignment to Baldwin-Lima-Hamilton Corp, where he served as vice president in charge of manufacturing. He started with Westinghouse in 1915.

Dr Karl B. McEachron, manager of General Electric Co's laboratory-engineering department of the Transformer and Allied Products Division, Pittsfield, Mass., has been awarded the 1952 award of the Engineering Societies of New England. Called "The New England Award," the ESNE honor is conferred not oftener than once each year to a living engineer, resident of New England, whose outstanding work and character merit recognition by his fellow engineers of the New England states.

Darrell Knight, who has been with Motorola Inc, Chicago, for the past two and a half years, will now direct the trade press relation activities of Motorola's Communications and Electronics Division. He succeeds Dale Samuelson who has resigned. Samuelson had served Motorola for more than two years.

Iowa Electric Assigns Brown to a New Post

Harold Brown, system supervisor for Iowa Electric Light & Power Co, has been appointed chief electrical engineer. He succeeds John M. Drabelle who has retired (EW April 7, p 208).

Brown will be in charge of electrical engineering for the entire system and also design and construction of transmission lines, substations, power plant electrical equipment, relays and communication systems, and load studies for the determination of system growth and expansion.

He joined the company in 1924 as an electrician. He was appointed chief electrician in 1926 and remained in that job until 1941 when he became electrical engineer. In 1947 he was named system supervisor, a post he held until his recent appointment.

Graduating with a bachelor of science degree in electrical engineering from Iowa State College in 1923, Brown worked for General Electric Co for 14 months before joining Iowa Electric.

Prof Paul S. Creager of the school of electrical engineering at Rutgers University will spend two months this summer with New Jersey Power & Light Co. Creager's employment with New Jersey P&L is in keeping with the company policy which is designed to encourage college instructors to

become acquainted with utility employees and their activities. His principal assignment will be to determine transmission losses on New Jersey P&L's 114-kv system.

Glen P. Burns has joined W. H. Brady Co, Chippewa Falls, Wis., as manager of advertising and sales promotion. Previously he was associated with the "Milwaukee Journal," Allis-Chalmers Manufacturing Co, and Westinghouse Electric Corp.

Newell J. Corwin has been appointed manager of General Electric Co's Scranton, (Pa.) Tube Works, which was purchased recently by the tube department from the GE electric sink and cabinet department and will continue under the direction of Neil C. Mulcock, present works manager, until the change of manufacturing operations has been completed. Corwin, who joined GE in 1937 and is now located at Schenectady, will assume his new post at a date which will be announced later.

Ralph S. Bell, for 32 years a national leader in public utility merchandising, has retired as director of merchandising consultation for Commonwealth Services, Inc, New York. Bell, who has been in executive merchandising positions with Commonwealth and predecessor companies since 1920, was appointed to the director's post in 1945.

Nichols Is Made a VP by Superior Water L&P

Lawrence A. Nichols, general sales manager of Superior (Wis.) Water, Light, & Power Co since 1941, has been named a vice president of the utility.

Nichols first entered the utility business in 1930 with Wisconsin Valley Electric Co, which later became affiliated with Wisconsin Public Service Corp. He joined the sales department of Lake Superior District Power Co in 1933 with headquarters at Ironwood and Ashland and came to Superior Water L&P in July 1935 and was put in charge of the commercial lighting department.

During World War II Nichols served with the Navy as a lieutenant commander, returning to the general sales manager's post at Superior Water L&P in 1945.

Detroit Edison Reveals District Appointments

Detroit Edison Co has appointed Arthur L. Lane to the new post of district commercial supervisor with headquarters at Detroit. The utility also named Howard L. Canfield district manager and Kenneth J. Mudie assistant district manager of the Port Huron district, and Gage R. Cooper district manager of the Ann Arbor district.

Lane, former district manager at Port Huron, will have charge of sales department activities in the districts outside Detroit and will report to the assistant manager of sales. He joined the company in 1925.

Canfield, who has been assistant district manager of the Port Huron district since 1948, will be in charge of all sales department activities in Detroit Edison's largest sales district. He started with the utility in 1931. Mudie, a former power sales engineer in Wayne and Detroit, has been appointed assistant district manager of the Port Huron district. He began with Detroit Edison in 1934.

Cooper, acting manager of the Ann Arbor district since last August, will be in charge of sales department activities of the district. He came to the company in 1933.

•

Loyal J. Murphy has been named manager of the engineering and service department for the Buffalo (N.Y.) office of Westinghouse Electric Corp. He succeeds D. O. Tylee, who has been named consulting engineer to specialize on engineering problems on negotiations involving large turbine generators. Murphy, who joined Westinghouse in 1918, will have charge of the company's engineering activities in New York State.

Carl Feldman has resigned from the power sales department of Boston Edison Co after 22 years' service in lighting and industrial promotion work. He has opened offices at Kenmore Square, 484 Commonwealth Ave., Boston, Mass., as a rate analyst and electrical engineer.

Roy Carter, L. H. Garner and **I. J. Karassik** have been named to newly created managerial positions by Worthington Corp, Harrison, N. J. Carter, who joined Worthington in 1923 and has been with the Centrifugal Pump Division since 1932, has been appointed manager of the volute pump section. Garner, who started with the firm in the Centrifugal Pump Division in 1930, has been made manager of the process pump section. Karassik, with the organization since 1934 and the Centrifugal Pump Division since 1935, has been named manager of the multi-stage pump section.

W. Nelson Abbott has been made merchandise manager of the refrigeration specialties department of Westinghouse Electric Corp's Appliance Division at Springfield, Mass. The new merchandise manager, who comes from a sales promotion manager's post with Westinghouse Electric Supply Co at St. Paul, Minn., joined Westinghouse in 1942.

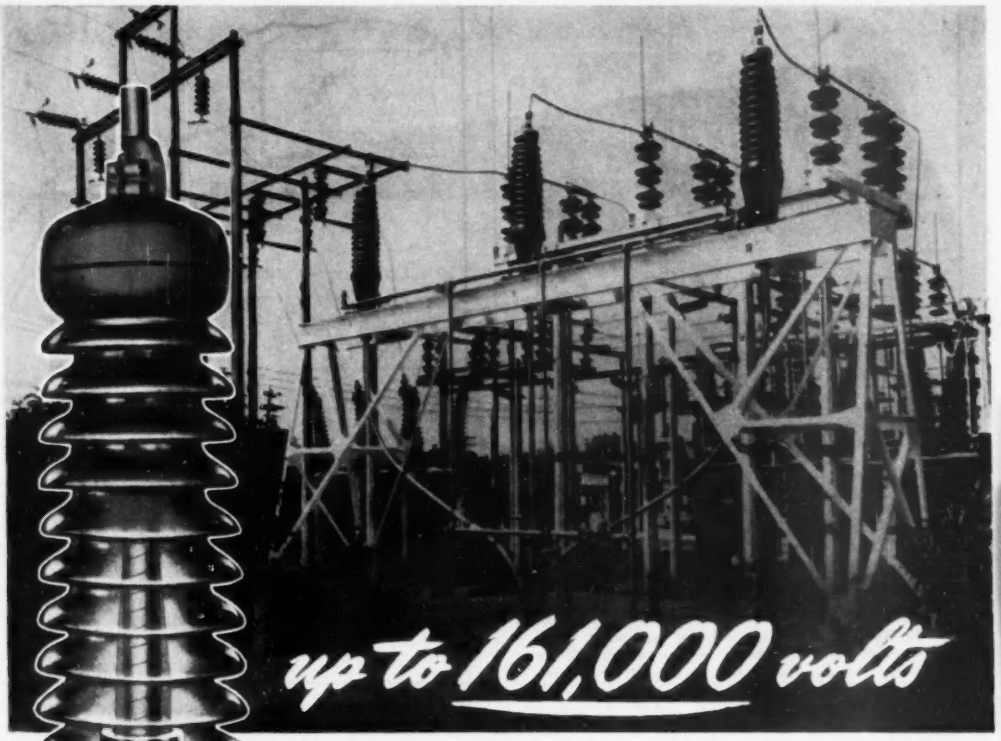
Richard A. Gehr has been named sales manager of heaters and devices for General Electric Co's industrial heating department. Gehr, who has been New York district heating specialist since 1946, succeeds Robert W. Kise, who recently was appointed manager of product planning for the industrial heating department. The new sales manager joined GE in 1943.

Frank C. Pesveyc, sales promotion manager of the sales department of Public Service Electric & Gas Co, Newark, N. J., recently was presented the Thomas N. McCarter Electric Award for 1951. The award, a medal and certificate, is given annually to the employee in the company's electric department who has contributed most during the year to the efficiency and progress of the department.

Mildred A. Edwards has been appointed home economist for the Middle Atlantic district of Westinghouse Electric Corp. Before this appointment Miss Edwards served as home economist for the Bluefield (W. Va.) Division of Appalachian Electric Power Co.

OBITUARY

George F. Frecking, Sr, 76, manager of the Newport (Ky.) office of Union Light, Heat & Power Co for 21 years before he retired in 1946, died May 19 at Covington, Ky.



HIGH PRESSURE...OIL FILLED

POTHEADS by G & W

Proper treatment of mechanical and electrical stresses permit this simple G & W design. Full 200 pound pipe line oil pressure is retained by the relatively small bore porcelain shell. Top and bottom fittings are fabricated, nonmagnetic, stainless steel—sealed by a minimum of gasketed joints.

Stress relief cone, supplemented by porcelain stress control tube, makes efficient use of the internal diameter and length of porcelain shell—and reduces the amount of installation labor.

Phantom view shows G & W type "ATA" 161 kv. pothead. Background installation shows G & W type "ATA" 115 kv. potheads.

For further data, drawings and prices, send us a complete description of your cable.

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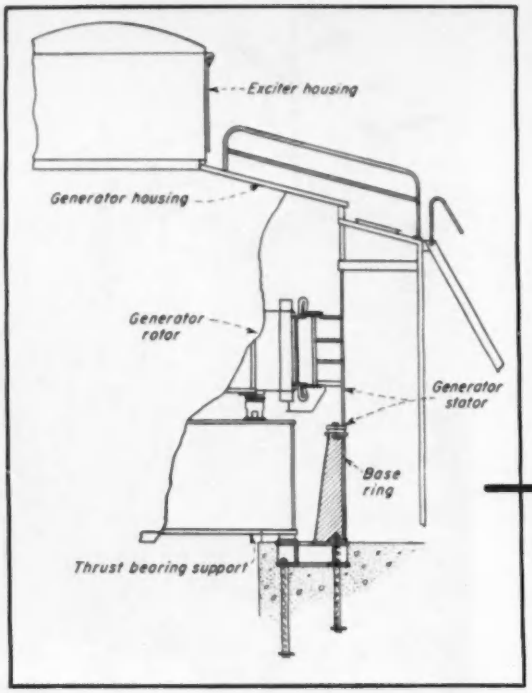
Cable terminating, connecting and sectionalizing devices

Representatives in principal cities of U. S. A. In Canada—Powerlite Devices, Ltd., Toronto and Montreal

These men built the plant . . .

Fred McCormick, left, Idaho Power's resident engineer, Ed Woodhead, and Glenn Johnson, construction superintendent for the contractor, are well pleased with the project. Third unit, at far end, was completed last month



STATOR SUPPORT of new design consists of fabricated base ring which rests on common sole plate with thrust bearing. Construction

Steel Base Beats Concrete Growth

New design for generator stator support eliminates misalignment resulting from growth of concrete made with aggregate of high alkalinity as found in region of plant

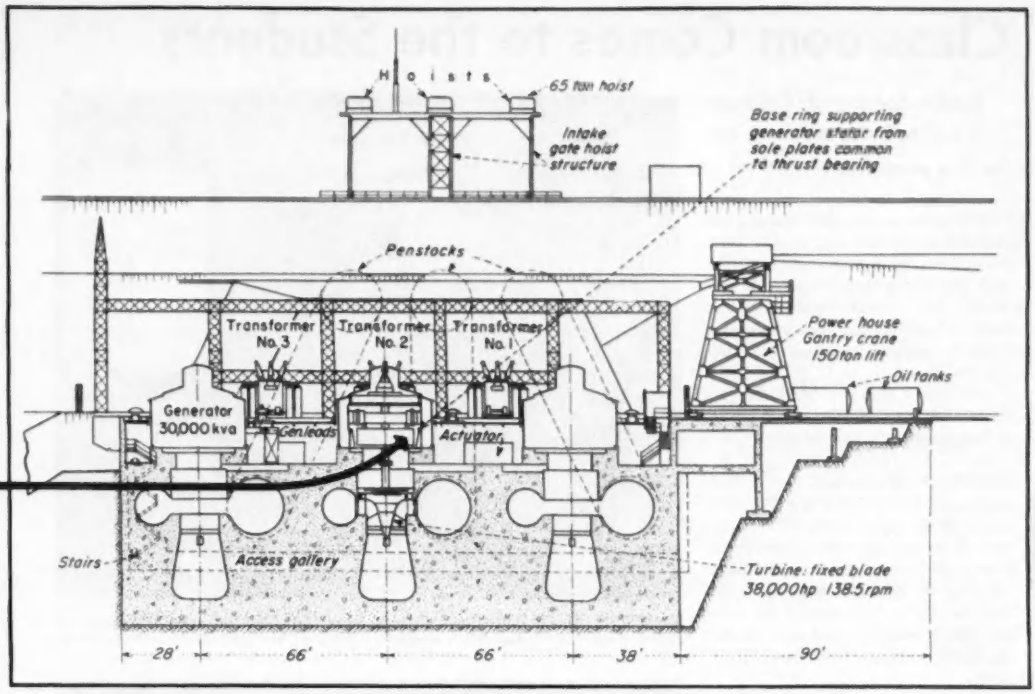
Idaho Power Co's new 90,000-kw C. J. Strike hydro plant on the Snake River was dedicated last week. It is the first plant to be completed with a new structural design intended to eliminate generator-turbine misalignment resulting from concrete growth. This construction carries the lower thrust-bearing bracket and the stator frame on a common base ring. It prevents misalignment of generator parts in the event of alkali aggregate reaction and growth in the concrete foundation, or settlement in the powerhouse structure. Alkalinity of the region's available aggregates causes the growth which can only be minimized by using special cement mixes.

Previous Practice . . . In earlier installations the stator foundation and the thrust-bearing block, which support the rotating parts, were on the same concrete foundation but were separated by a material thickness of concrete. When this concrete was disturbed by growth the design distance was changed non-uniformly. This destroyed generator alignment as well as alignment between the generator and turbine.

In the new design the stator rests on a distance piece or base ring fabricated from heavy plate steel. The bottom of the base ring is at an elevation suited to the stator and the lower bearing bracket. At this elevation, both the stator and thrust-bearing bracket are supported by common sole plates. Thus any possibility of misalignment with the generator is eliminated. This arrangement also facilitates initial lineup and any subsequent changes that may be required.

Semi-Outdoor Design . . . The plant was designed for conventional, semi-outdoor construction, with the three 30,000-kva, vertical waterwheel-type generators and their shaft-mounted exciters totally enclosed for outdoor service. Generators are self-cooled with water supplied by gravity from the forebay. Switchboard and all auxiliary equipment are located on the operating floor of the powerhouse which has no basement. Access to draft tubes and scroll cases is from a longitudinal gallery through the powerhouse substructure.

Main 3-phase power transformers and auxiliary transformers are located adjacent to the upstream side of the powerhouse. Their weight is carried through concrete piers to the powerhouse wall and penstock thrust block. Each generator is connected solidly to its transformer by isolated-phase



eliminates misalignments from concrete growth found in previous designs. New design also aids in initial and minor adjustments. Plant incorporates semi-outdoor design features. Its three 30,000-kva generators and exciters are totally enclosed for outdoor operation

in Idaho Power's New Hydro Plant

bus, without any low voltage breaker.

Generator switching is done through 138-kv oil circuit breakers which along with two line breakers and their associated disconnecting switches are located on a bench in the side of the dam between the powerhouse and intake. Auxiliary power for the plant is supplied by 400-kva, 3-phase, 13,800/480-v transformers from each generator, or a 300-kva transformer from a nearby distribution substation.

Record Construction . . . The earthfill dam and the power plant were completed in record time. Power was delivered from the first two of the three 30,000-kva units 15 months after start of construction, and the plant was completed within the next month. The Strike Plant is Idaho Power's sixth major project since 1946. Total project cost of $21 million, including transmission line, brings the company's post-war expansion program up to almost $100 million.

SPECIAL DATA—C. J. Strike Plant

Location—70 miles southeast of Boise, Idaho

Peaking capacity—90,000 kva

Turbines—Three, 38,000 hp, 88-ft head, 138.5 rpm, fixed blade

Generators—Three, 30,000 kva, 13.8 kv, 3-phase, 60 cycle totally enclosed for outdoor service

Transformers—Three, 27,600 kva (self-cooled), 34,500 kva (forced air), 138/13.8 kv, 3-phase

Auxiliary power transformers—Three 400 kva, 13,800/480 v, 3-phase, and one 300 kva, 13,800/480 v, 3-phase (from distribution substation)

Powerhouse—198 ft long, 64 ft wide

Penstocks—Three, 22-ft diameter, 342 ft long

Earthfill dam—3,200 ft long, 675 ft wide at base, 30 ft wide at top

Total cost—$21 million

Classroom Comes to the Students

Public Service of Colorado uses bus to bring training, discussion programs to workers

Public Service Co of Colorado has solved the problem of two-way communication with employees scattered over its widespread system. It put wheels on its conference room and now brings training and discussion sessions directly to all of its employees.

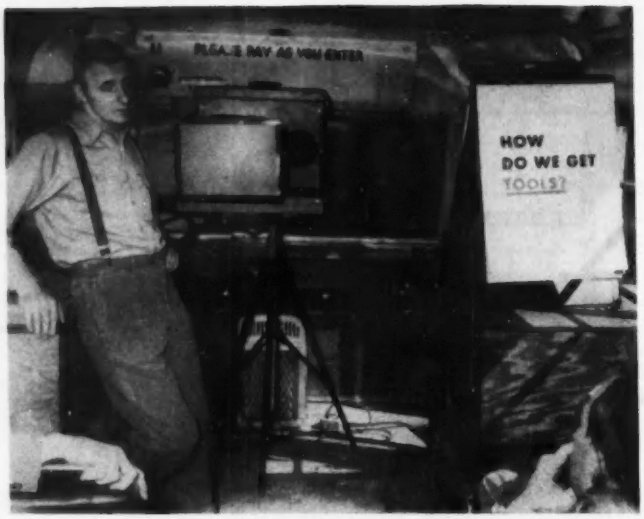
The mobile unit is a converted passenger bus that travels to all points of the company's service area.

First-Hand Information . . . Employees who are seldom near the company's main office conference rooms now sit in the bus and discuss problems and programs, learning first hand why certain jobs are being done or what is new in the company, the electric utility industry, and also in the industry's relations with the government.

Safety job improvement methods, the story of planned expansion and many other subjects are brought out and discussed in an informal manner in the novel conference-classroom. The company feels that workmen and their supervisors have a better realization of teamwork after such discussions.

The value of the traveling conference room has proved immeasurable to the company. Great improvements in employee relationships have been noted and many man hours saved as a result of the classroom coming to the students.

Observers of the company's education and information department also report that the closer confines of the bus, coupled with the fact that groups are small, stimulates discussion among the participants.



DISCUSSION LEADER Scotty Purvis of Public Service Co of Colorado uses "flip charts" to explain a point to a group of the company's employees. Bus also carries movie equipment

UTILITY PRESIDENT Loiseau chats with a group of employees assembled from an area in Denver. Company executives frequently confer with workers at discussion sessions in bus

Movies, Even . . . The bus is fully equipped with a daylight movie projector powered with a portable power plant and "flip charts" used in the information program. A compact cabinet arrangement built into the bus provides storage space and upholstered seats and individual windows provide convenience and comfort for the workers.

Forty persons a day attend meetings in the bus, and schedules are handled in such a manner that the combined information program reaches every employee of the company except those who miss because of illness, vacation, or other non-scheduled absences.

Since the new system has been added to the education and information department, enthusiasm for the traveling conference room has spread, and expansion of the program already is being considered by company officials.

John E. Loiseau, president of Public Service, recently told a group of workmen in the bus: "Every person in our company is entitled to have a voice in company plans for the future and current activities. I'm certainly happy we've found this method of exchanging information and ideas."

MEETINGS

Talks on Winter's Hazards . . .

. . . are planned for summer general meeting of American Institute of Electrical Engineers scheduled for June 23-27

Despite the fact that June is busting out all over, members of the American Institute of Electrical Engineers will direct their attention to winter's playmates—sleet and ice—at the association's summer general meeting. The meeting is scheduled to be held June 23-27 at Hotel Nicollet, Minneapolis, Minn., and will mark the 50th anniversary of the Minnesota section.

To Discuss Melting Practices . . . Talks on winter hazards will be held at a transmission and distribution session planned for Tuesday, June 24. Sleet melting practices of the Niagara Mohawk system will be discussed by H. B. Smith and W. D. Wilder, Niagara Mohawk Power Corp. Sleet thawing practices of the New England Electric system will be explained by C. P. Corey and H. R. Selfridge, New England Power Co; and H. R. Tomlinson, New England Power Service Co.

Forty-two years' experience combating sleet accumulations will be reviewed by A. N. Shealey, K. L. Althouse, and R. N. Youtz, Pennsylvania Water & Power Co. Ice melting and prevention practices on transmission lines will be dealt with by V. L. Davies and L. C. St. Pierre, Public Service Co of Northern Illinois. Sleet melting on the American Gas & Electric system will be explained by S. C. Bartlett, C. A. Imburgia, and G. H. McDaniel, American Gas & Electric Service Corp.

Round Table Session . . . A round table discussion on power generation is planned for Friday, June 27. Among the subjects to be discussed will be the financing of small hydroelectric generating stations for heads less than 100 ft, and auxiliary power requirements in hydroelectric generating stations.

The electrical engineers' stake in safety will be emphasized by H. F. Webb, West Penn Power Co, at the safety session. Extinguishing fires in electrical equipment will be handled by J. E. Appel, Commonwealth Edison Co, and J. A. Bono, Underwriters' Laboratories, Inc.

Lamme Medal . . . A feature of the AIEE meeting will be the presentation of the Lamme Medal to Arthur E. Silver, Upper Montclair, N. J., "for his pioneering of rural electrification by designing the simplified farm-type transformer combined with high-voltage, long span, and common neutral line construction."

Dr Lawrence R. Hafstad, a director of the Atomic Energy Commission's Division of Reactor Development, will speak at the meeting. His subject will be "The Reactor Development Program of the AEC."

Arrangements have been made for trips to Northern States Power Co's Riverside Steam and St. Croix Falls Hydroelectric plants. A ladies' program has been planned, including visits to the Betty Crocker Test Kitchens of General Mills, Inc, and the Red Wing Potteries.

Marks 50th Anniversary

The American Society for Testing Materials will celebrate its 50th anniversary when it meets June 23-27 at the Hotels Statler and New Yorker, New York. Throughout the meeting, at which 30 symposiums and sessions will be held, the Tenth Exhibit of Testing Apparatus and Related Equipment will be in progress and the biennial Photographic Exhibit also will be staged. Dr Detlev W. Bronk, president of National Academy of Sciences and head of Johns Hopkins University will be a guest speaker.

ASME Plans Meeting

Ten power sessions, with seven devoted to gas turbine power, will be held at the 1952 semi-annual meeting of the American Society of Mechanical Engineers planned for June 15-19 at the Hotel Sheraton-Gibson in Cincinnati, Ohio. Plans have been made to visit the Walter C. Beckjord Station of Cincinnati Gas & Electric Co.

CALENDAR

National Association of Electrical Distributors
44th Annual Convention, Hotels Ambassador-Chelsea, Atlantic City, N. J., June 9-12.

International Organization of Standardization
Triennial Meeting, Columbia University, New York, June 9-21.

Pacific Coast Electrical Association
Annual Convention, Hotel del Coronado, Coronado, Calif., June 11-13.

American Society of Mechanical Engineers
Semi-Annual Meeting, Sheraton-Gibson Hotel, Cincinnati, Ohio, June 15-19; Fall Meeting, Sheraton Hotel, Chicago, Ill., Sept. 8-11.

National Association of Corrosion Engineers
Short Course on Corrosion sponsored jointly by Cleveland Section of NACE and Case Institute of Technology at the institute, Cleveland, Ohio, June 16-20.

Illuminating Engineering Society
Northeastern Regional Conference, Hotel Preston, Swampscott, Mass., June 19-20; National Technical Conference, Edgewater Beach Hotel, Chicago, Ill., Sept. 8-12.

American Institute of Electrical Engineers
Summer General Meeting, Hotel Nicollet, Minneapolis, Minn., June 23-27.

American Society for Testing Materials
Annual Meeting, 50th Anniversary, Hotels Statler-New Yorker, New York, June 23-27.

National Retail Credit Association
International Consumer Credit Conference, Statler Hotel, Washington, D. C., June 23-26.

Canadian Electrical Association
Annual Convention, Banff Springs Hotel, Banff, Alberta, June 30-July 2.

Maryland Utilities Association
Cavalier Hotel, Virginia Beach, Va., Sept. 5-6.

Rocky Mountain Electrical League
Fall Convention, Colorado Hotel, Glenwood Springs, Colo., Sept. 7-10.

American Standards Association
National Standardization Conference in conjunction with Centennial of Engineering, Museum of Science-Industry, Chicago, Ill., Sept. 8-10.

Edison Electric Institute
Accident Prevention Committee, Sheraton Hotel, Rochester, N. Y., Sept. 15-16; Prime Movers Committee, Roosevelt Hotel, St. Louis, Mo., Oct. 6-7; Electrical Equipment Committee, Roosevelt Hotel, New York, Oct. 13-14; Transmission-Distribution Committee, Hotel Adolphus, Dallas, Tex., Oct. 23-24.

Public Information Program
Annual Workshop Conference, Edgewater Beach Hotel, Chicago, Ill., Sept. 18-19.

***Public Utilities Association of the Virginias**
Greenbrier Hotel, White Sulphur Springs, W. Va., Sept. 19-20.

National Electronics Conference
8th Annual Conference, Sherman Hotel, Chicago, Ill., Sept. 29-30 and Oct. 1.

Wisconsin Utilities Association
Convention of Technical-Sales Sections, Schroeder Hotel, Milwaukee, Wis., Oct. 1-3.

National Farm Electrification Conference
Statler Hotel, Detroit, Mich., Oct. 20-21.

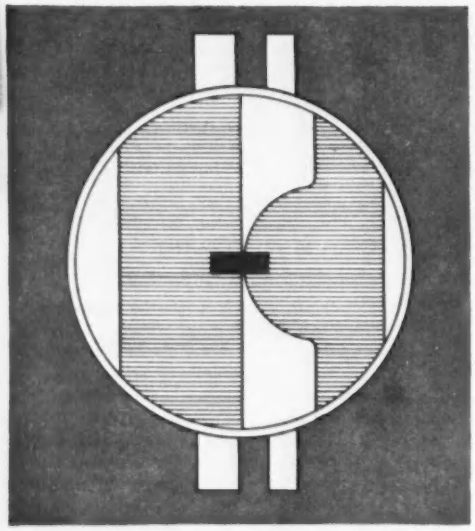
National Electrical Manufacturers Association
Annual Meting, Haddon Hall, Hotel, Atlantic City, N. J., Nov. 10-13.

* **Addition this week.**

new tap changer design

KEEPS TRANSFORMERS ON THE LINE . . . CURBS MAINTENANCE

New Tap Changer for De-energized Operation on Allis-Chalmers Power Transformers Combines Basic Principles and Precision Workmanship to Give Unexcelled Service Performance.



ONE CURRENT PATH PER CONTACT, established by rounded point on a flat surface, assures high contact pressure. Both magnetic and applied forces are concentrated at this single point on the contact surface.

THE IMPROVED PERFORMANCE found in the new Allis-Chalmers tap changer is the result of a radically different contact principle that insures cool, long-life operation and makes contact deterioration virtually impossible.

The tap changer is designed so that the current path on each contact is established under high pressure by means of a rounded point on a flat surface. The union is cool and positive. At the same time, flexible action maintains equal pressure on moving members, making them completely self-aligning . . . an important factor in service continuity.

Utilizes Magnetic Forces

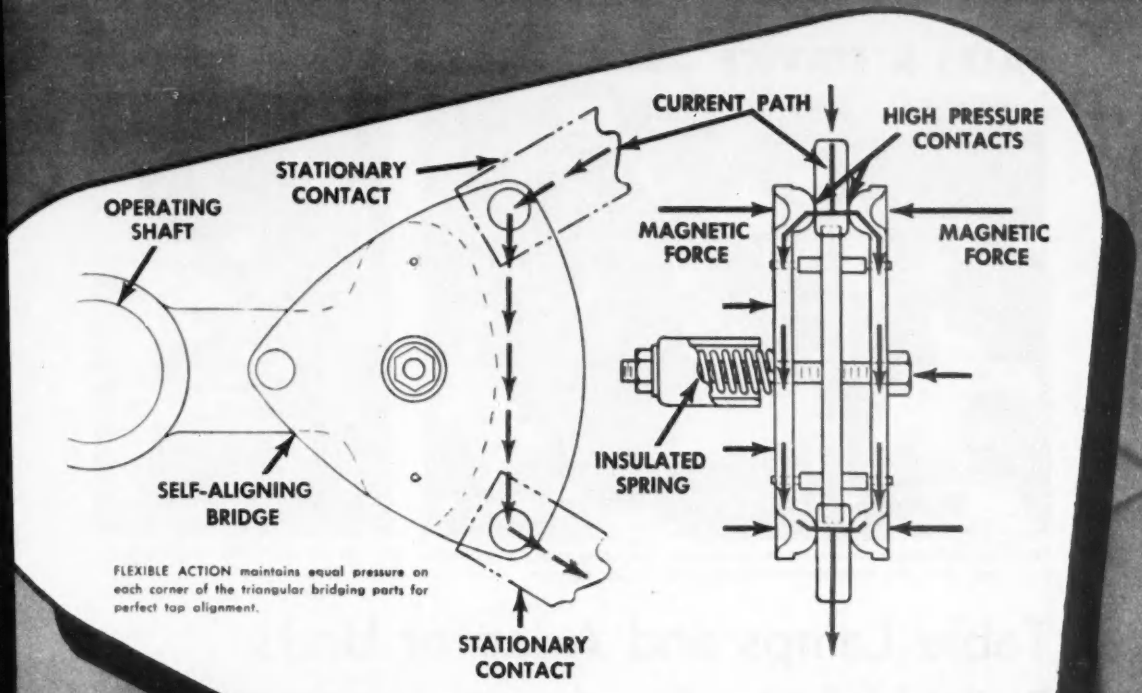
A distinctive feature of the new tap changer is the contact bridging member with parallel parts carrying current. By utilizing magnetic forces created by heavy current, contact pressure is actually increased. This automatically prohibits "throw open" action caused by short circuits on the electric power system.

Self-Cleaning Contact Action

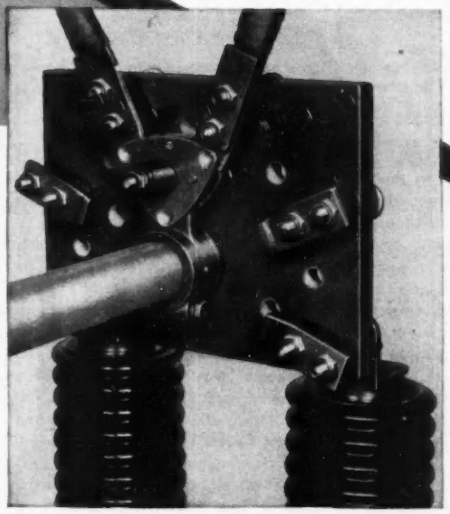
Magnetic forces added to a strong applied force provide a low resistant path for current. Self-cleaning action of contacts eliminates carbon growth and reduces heating.

Engineering of this kind can save you money on your next power transformer installation. Why not investigate its benefits today.

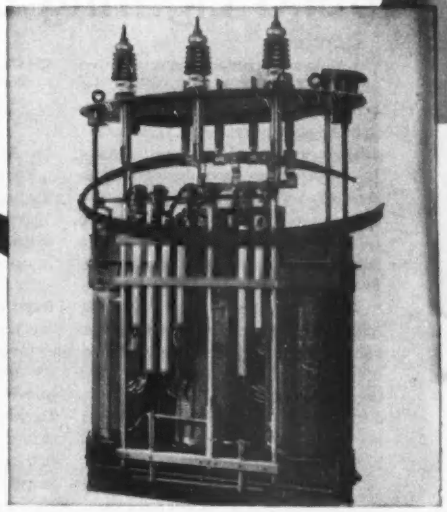
A-3644



FLEXIBLE ACTION maintains equal pressure on each corner of the triangular bridging parts for perfect tap alignment.



THIS VIEW of the new A-C tap changer shows moving contact member bridging the stationary tap lead connections. The tap changer employs copper-to-copper rounded point contacts. Voltage stresses and corona were reduced by keeping sharp corners and edges to a minimum.



MOUNTED ABOVE the core and coil assembly, this new tap changer is easily accessible for periodic inspection through the cover handholes. Tap positions are changed on all phases simultaneously.

ALLIS-CHALMERS

MILWAUKEE 1, WISCONSIN

A-C ALLIS-CHALMERS

TRAINING SALESMEN in a special lighting salesmanship course. Men made sales demonstrations before fellow sales representatives—the most critical of all audiences

ON-THE-JOB-TRAINING—Experienced salesman analyzes beginner's work

Table Lamps and Adaptor Units Build Lighting Load

CHARLES J. SINNOTT, Residential Sales Manager, New Orleans Public Service, Inc

Residential contact representatives of New Orleans Public Service Inc broke previous records in an extended lighting activity featuring table lamps, adaptor units, and lamp restorations. In 71 campaign days during the period of September 5-December 14, 1951, an average of ten men, assigned full time to this activity, brought in 568 kw of increased load totaling over $14,000 of estimated annual revenue.

The campaign featured selective selling to low use customers whose lighting was most in need of improvement. Since more revenue is realized on the initial brackets of the rate, increased usage by this type of customer is more profitable to the company.

Section Supervisor John Davis consulted the records of previous lighting campaigns to determine exact routes for the representatives to cover. He was aided in this by a customer-indexing system maintained in the department files. A work card is kept on every customer in the city, with an informational check list for race and tenure, size of family, type of house, approximate income, and major appliances owned. On the back of the card are the recorded results of previous sales calls made on the customer by the representatives. The survey information is maintained by the men themselves and is checked periodically.

With the aid of these cards, marked maps showing areas previously covered in campaigns, and records of sales results from each area, the target territories were subdivided and assigned to the representatives.

Originally it was the plan to enter the campaign with twelve experienced men in Section three of the Residential Division. But by the summer of 1951, promotions and the armed services had taken all but three of the older employees in that section. Vacancies had been filled with new and inexperienced representatives.

Each new sales representatives goes through six weeks of indoctrination when he first joins the company, and attends one departmental and three divisional training meetings every month thereafter. In addition, frequent section meetings are held. But something more was needed to train the new men. The continuous training schedule was expanded for the two months previous to the campaign and more time was devoted to the basic problems of selling lighting. A special Lighting Salesmanship Course was taught and the men were required to make sales demonstrations before the most critical of all audiences: their fellow sales representatives.

The campaign started on September 5 and ran through December 14. The theme was Sweepstakes Season at Residential Acres, and a scoreboard, complete with miniature race horses, was erected to record the daily totals. The campaign was divided into seven "sprints," each lasting two weeks. In addition to the grand prize for the representative with the greatest increased wattage per campaign day, there were smaller prizes for the first, second, and third place winners of each short race. In this way, interest was maintained for the whole fourteen-week period. The sprints were so designed that they could feature any one unit that was lagging behind quota.

The items selected for the campaign were:

1. An enclosing glassware adaptor with a 150-w bulb.

2. A semi-indirect glassware adaptor unit with two 75-w bulbs.

3. A Better Sight table lamp with a 150-w bulb.

4. The 50 GA enamel bowl bulb.

5. Restorations of existing lamps in the customer's house when the lamp was not in use because of a broken switch, broken bowl, or some similar defect requiring easy repair.

Only nine men were in the section when the campaign started. For the first week, the supervisor and the three experienced salesmen worked with the new men in the field. A tenth man finished training nine days later and another midway in the campaign. This gain was offset when one of the other representatives was called into the Army. Two more new employees entered the field two weeks before the campaign was over.

The results of the intensive training were shown when the final results of the campaign were tabulated. The first five places were won by new employees. Jack Land was the winner of the 14-week "Sweepstakes." He accumulated 66.3 kw, an average of 933.8 increased wattage per campaign day. Dick Roach, who had joined the section midway in the campaign, was second with 43.1 kw and 898.1 w and Killian Huger was third with 62.3 kw and 877.6 w.

One feature of the campaign was the large number of portable lamps that the representatives restored to use. Six hundred and twenty lamps were found out of use and in need of repair. They were either repaired in the company's repair shop or restored, by the men in the field.

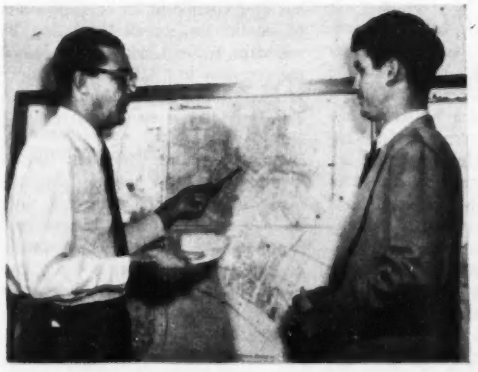
Rain disrupted the work on 23 days and there were 24 man days lost because of illness. In addition, time was taken out for 18 training meetings during the campaign period.

To sum up—the campaign was directly responsible for putting 568 kw of additional lighting load on the company's lines. Converted to dollars, this represents an estimated annual revenue of $14,000, which in itself substantiates the success of the activity.

However, an additional advantage of considerable importance was achieved; namely, the fact that the story of good lighting was brought in a personalized manner to 8,000 customers during the campaign period. Also, the 2,250 homes where merchandise was sold will serve as advertising for better lighting.

Statistics of the Lighting Campaign

Sales Data and Statistics	
Working Days (Period of Campaign 9/5/51—12/14/51)	71.00
Effective Man Days	572.00
Effective Man Days per Working Day	8.06
Contacts	8,008.00
Increased Load	567.9 kw
Estimated Annual Revenues (Based on $25 per kw per year)	$14,197.85
Direct Sales Expense (Salaries & Auto Expense of Repvs & Supv)	$10,603.70
Number of Sales Orders	2,250.00
Delivery of Orders	
By Sales Representatives	1,049.00
By Company Truck	1,201.00
Summary of Section Sales	**Units**
Lamp Restorations	620.00
Enclosing Glassware Adaptors	227.00
Semi-indirect Glassware Adaptors	634.00
Table Lamps	674.00
GA 50 Enamel Bowl Lamps	593.00
Increased load by installing proper size lamps	231.00 kw
Campaign Ratios	
Average Contacts per Man Day	14.00
Average Increased Watts per Man Day	992.90
Average Increased Watts per Contact	70.90
Average Increased Watts per Sales Order	252.40
Expense Ratios	
Expense per Contact	$1.32
Expense per Sales Order	$4.71
Expense per Man Day	$18.54
Estimated Revenue	
EAR per $ Expense	$1.34
EAR per Contact	$1.77
EAR per Sales Order	$6.31



ASSIGNING TERRITORY—Selective selling, plus thoroughly trained salesmen, brought results in low-use customer areas

CONTEST WINNERS receive congratulations. From left, Dick Roach, second place; Killian Huger, third; Jack Land, first

Skilled Personnel Scarcity . . .

. . . will be a problem as engineering graduates will drop to only 16,500 in 1954, General Electric executive predicts

Shortage of skilled personnel, not unemployment, will be the future problem of industries, F. M. Roberts, administrative manager of General Electric Co's engineering department predicted before the Industrial Electrification Forum, sponsored jointly by General Electric Co and the Dayton Power & Light Co in Dayton, Ohio, recently. The meeting was attended by more than 150 leading industrialists from the Dayton area.

Engineering Graduates to Drop . . . With regard to the shortage of skilled personnel, he said, engineering graduates will drop from the 38,000 in 1951 to 16,500 in 1954.

"Our problem in the years ahead will not be unemployment but overemployment," he declared. "We shall face a 20% increase in demand for goods with an estimated 4% increase in our working force by 1960."

On the basis of U. S. Census Bureau figures, GE's administrative manager predicted a rise in Ohio population of at least one million by 1960. He stated the number of workers here and in other states was not keeping up with population increase. He declared that the only way to meet that situation was by increasing the yearly output per person.

Four-point Program . . . Roberts also offered the following four-point program to keep the American economy in high gear.

1. Conserve manpower and make horsepower available to each worker.
2. Reduce waste to make the most of our raw materials.
3. Cut costs by more mechanization and improved manufacturing conditions.
4. Increase the quality of products.

"Wages are not going to be reduced much," Roberts pointed out. "Taxes and costs of materials are not likely to come down, but if production goes up, we can still make a fair margin of profit, meet expenses and provide a buffer against further inflation," he added.

In closing the forum, H. E. Deardorff, vice president and chief engineer of Dayton Power & Light Co gave a resume of his company's program in the Miami Valley.

"By August of 1953, our total generating capacity, with some improvements at the Tait Station, is expected to be 580,000 kw," he said. "Since our load estimates indicate peak demands for the years 1953, 1954, and 1955 of 455,000, 485,000 and 530,000 kw, respectively, it is apparent that a very appreciable reserve capacity will be available to provide for the expanding power requirements of our service area."

Westinghouse Files Suit Against IUE for $500,000

Westinghouse Electric Corp has filed a counter-claim in United States District Court against the International Union of Electrical, Radio & Machine Workers, CIO, for $500,000 damages resulting from the recent closing of the Westinghouse lamp plant at Bowling Green, Ky.

Westinghouse Lamp Division officials reported that the civil action has been filed with the United States District Court, Western District of Kentucky, at Bowling Green where the case has been set for trial next Nov. 13.

The Bowling Green plant was closed permanently last Dec. 4 after the union had refused to give the company some assurance that illegal work stoppages there would be discontinued. Last November, the Kentucky Division of Unemployment Insurance denied the union's charge of "lockout" and in March a regional director of the National Labor Relations Board refused to issue a complaint against Westinghouse for alleged unfair labor practices, ruling lack of sufficient evidence to support the union's charges.

In its counter-claim against both IUE-CIO and Local 740, Westinghouse charged that in violation of the national agreement between company and union a series of illegal work stoppages was carried on which ultimately cost the company $500,000 and forced closing of the plant.

UE Wins Round from IUE in Representation Battle

Another chapter has been written in the fight between the CIO and the United Electrical Workers, independent, for representation of General Electric Co employees.

The International Union of Electrical, Radio & Machine Workers, CIO, lost an attempt to get bargaining rights in five plants covered by UE's national contract with GE, which does not expire until September. The plants are in Tifflin and Niles, Ohio; Oakland, Cal.; Detroit, Mich.; and Hudson Falls, N. Y.

The National Labor Relations Board ruled that the contract stood as a bar to elections by the CIO before September. NLRB's rule is that it will not recognize rival elections where another union has a contract, unless the contract in "clear and unmistakable language" permits such elections.

GE supported the petitions by the CIO union. The company argued their contract with UE permitted the elections.

LABOR BRIEFS

Cleveland Electric Illuminating Co has announced that one employee in four has now completed 25 or more years of continuous service, including its president, Elmer Lindseth, who joined the company in 1926 as a test helper at Lake Shore power plant, and became president seven years ago.

Bureau of Labor Statistics, in its monthly statistical report "Employment and Payrolls" for April said, on page 21, "Rapidly rising output per man-hour has been characteristic of this industry (electric light and power utilities). While total electric power generating capacity has increased 43% and kwhr produced has increased 45% since 1947, employment in privately operated electric power systems has risen only 10%."

"Easiest fuse to renew I ever used. It's G-E"

"Only three pieces to handle—plus the link—when I renew blown links in this new General Electric time-delay fuse. It's a well-made, sturdy fuse, too. I like the ribs on the cap—they give a better grip than knurling. You can tell at a glance which end comes off."

You'll like these other features of G-E fuses too

General Electric makes them all

One-time fuses: All standard ratings from 3 to 600 amp. Available for both 250V and 600V service.

Renewable time-delay fuses: All standard ratings from 3 to 600 amp. Available for both 250V and 600V service.

Plug fuses: Transparent-top plug fuses. 3 to 30 amp, 125V.

All G-E fuses are listed by Underwriters Laboratories, Inc.

1. All contact surfaces on renewable fuses are silver-plated to eliminate heat caused by oxidation.

2. Newly designed links give accurate and consistent time-delay.

3. The simple three-piece construction applies to ferrule type fuses, too. This fuse has a patented hinged contact plate—no washers to drop.

For complete data, address Section D41A-627, Construction Materials Division, General Electric Company, Bridgeport 2, Conn.

You can put your confidence in—

GENERAL ELECTRIC

FINANCIAL

Court Upholds FPC Rate Cut

Decision expected to result in restitution of $3 million by Pennsylvania W&P to Consolidated of Baltimore

The Supreme Court has upheld a Federal Power Commission rate reduction on power sales made to Consolidated Gas Electric Light & Power Co of Baltimore by the Pennsylvania Water & Power Co.

The decision is expected to mean restitution of some $3 million to Consolidated, which has promised to pass it on to its customers. However, the exact amount to be returned by Pennsylvania W&P will be subject to further litigation.

FPC Orders Rate Cut . . . In 1949, FPC found that Pennsylvania W&P had charged its customers almost three times what it should have in 1946. It then ordered a rate reduction.

The Supreme Court was not called on to review the adequacy of the evidence to support the FPC findings as to a fair rate base, a fair rate of return, or any other findings except insofar as the court decision of several general questions might indirectly undermine them.

The court found:

- Pennsylvania W&P is subject to both parts one and two of the Federal Power Act. This means it is subject to regulation both as a public utility and an FPC licensee. Pennsylvania W&P had contended that it could not be subject to both parts of the act.
- Pennsylvania W&P power sales were in interstate commerce and therefore subject to FPC regulation. Pennsylvania W&P had contended that some 83% of its sales were to customers in Pennsylvania. But the court found that the integration of Pennsylvania W&P, Consolidated, and Safe Harbor systems produced commingled power flow, subject to FPC regulation. Noting that the integration of the systems allowed exchange of power as dictated by stream flow of the Susquehanna, the Supreme Court observed: "The commission's power does not vary with the rise and fall of the Susquehanna River."
- The contract between Pennsylvania W&P and Consolidated did not violate the anti-trust act. A majority of the court set aside a contention by Pennsylvania W&P that its contract with Consolidated constituted a violation of the Sherman Act. In effect, the court said the contract had been ordered and approved by FPC and thus was binding. Pennsylvania W&P had argued that the contract permits it to be controlled by Consolidated. But the court said, "To the extent that Pennsylvania W&P is being controlled, it is by the commission, acting under statutory authority, not by Consolidated, acting under authority of private contract terms 'legalized' by the commission."

Earlier the court had said, "In the highly unlikely event that Pennsylvania W&P's managerial freedom is ever threatened by such an order, it will be time enough to consider its validity."

Dissenting Opinion . . . A dissent filed by Justices William O. Douglas and Stanley Reed called the contract illegal because it violated the Sherman Act. "It is far better that one public utility win one more legal skirmish in its struggles against regulation, than that we abandon legal standards and let the regulatory agency run riot."

Financial Writers Present Award

William C. Mullendore (right), president of the Southern California Edison Co, receives the Southern California Financial Writers' annual certificate of merit from Herbert Weinstock, association president. The award was made "for business, educational and civic leadership, devotion to truth and integrity in business and government, and service to all the people in his fight to preserve the American way of life." In his speech of acceptance, Mullendore warned against our "phony" prosperity, and, emphasized that not just a change in administration but a change in people's thinking is necessary to get the country back to a sound economy.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
1952									
May 29	2.91	2.99	3.09	4.09	4.20	4.55	5.40	5.96	6.44
May 22	2.94	2.98	3.10	4.00	4.21	4.56	5.31	5.88	6.48
1st 1952	2.95	2.99	3.13	4.11	4.29	4.66	5.35	6.03	6.47
4th 1951	3.02	3.07	3.21	4.32	4.50	4.91	5.42	6.18	6.84
3rd 1951	2.87	2.91	3.04	4.05	4.27	4.61	5.32	6.24	7.05
2nd 1951	3.02	3.11	3.23	4.11	4.37	4.68	5.73	6.38	7.37

Data: Bain & Chandler, Inc.

EARNINGS

Company	Period Months	Ended	Net Income 1952	Net Income 1951	Earnings Per Common Share 1952	Earnings Per Common Share 1951
Arkansas Power & Light	12	April	$5,225,639	$4,545,247	$....	$....
California Oregon Power	12	April	2,313,611	2,404,009	....	....
Consumers Power	12	April	19,979,257	20,050,223	2.69(a)	2.97(a)
Dallas Power & Light	12	April	3,531,597	3,297,005	....	....
Houston Lighting & Power	12	April	7,547,919	6,483,487	....	....
Iowa-Illinois Gas & Electric	12	Mar.	4,955,965	4,607,414	2.14	2.42
Kansas City Power & Light	12	April	4,733,495	4,675,012	....	....
Louisiana Power & Light	12	April	2,581,460	2,643,641	....	....
Middle South Utilities, consolidated	12	April	11,434,560	10,450,500	1.84(b)	1.85(b)
Mississippi Power & Light	12	April	3,111,365	2,852,644	....	....
Puget Sound Power & Light	3	Mar.	3,456,978	4,174,774	....	....
Shawinigan Water & Power	3	Mar.	1,332,033	1,122,121	....	....
Texas Electric Service	12	April	7,324,274	5,539,422	....	....
Texas Power & Light	12	April	6,692,062	5,496,663	....	....

NOTES—(a) On shares outstanding at end of each period; (b) On average shares outstanding but excluding tax reduction due to amortization of emergency facilities.

FINANCING

Company and Description	Amount of Offering ($000)	Offering Price	Yield to Public
WEEK OF MAY 29—JUNE 4			
Preferred Stock			
Tampa Electric—50,000 sh 4.32% $100 par	$5,000	$102.25	4.22%
Common Stock			
Wisconsin Electric Power—702,486 sh (being offered to commonholders on 1-for-5 basis (a), record May 6 to expire May 29)	$14,050	$20.00	6.50%
Central Vermont Public Service—108,900 sh (being offered to commonholders on 1-for-6 basis, record May 19 to expire June 3; New England Public Service, owner of 35.5% of common waives its subscription rights)	1,334	12.25	6.53
Tampa Electric—60,000 sh	2,340	39.00	6.15
Northern States Power (Minn.)—1,108,966 sh (to be offered to commonholders on 1-for-10 basis (a), record June 5 to expire June 23)	11,644	10.50	6.67
WEEK OF JUNE 5-11			
Bonds			
Kansas Gas & Electric—1st mtg 1982	$12,000	.....	.....
Northern States Power (Minn.)—1st mtg 1982	21,500	.....	.....
Rochester Gas & Electric—1st mtg 1982	6,000	.....	.....
Common Stock			
Virginia Electric & Power—494,642 sh (being offered to commonholders on 1-for-10 basis (a), record May 23 to expire June 9)	$10,758	$21.75	6.44%
Kansas Gas & Electric—200,000 sh	.....	.....	.....
Public Service Electric & Gas—700,000 sh	.....	.....	.....
SCHEDULED FOR JUNE			
Bonds			**Bid Date**
Kentucky Utilities—1st mtg 1982	12,000	.....	une 17
Public Service Electric & Gas—debentures 1972	40,000	.....	June 17
American Gas & Electric—debentures 1977	20,000	.....	June 18
Central Louisiana Electric—1st mtg 1982	4,000	.....	June 23
Boston Edison—1st mtg 1982	15,000	.....	June 23
Gulf Power—1st mtg 1982	7,000	.....	June 24
Public Service Co of Indiana—1st mtg 1982	25,000	.....	June 25
New England Power—1st mtg 1982	5,000	.....	June 25
Preferred Stock			
Public Service Co of Indiana—800,000 sh $25 par	$20,000	.....	(b) June 18
Common Stock			
American Gas & Electric—170,000 sh	.....	.....	June 18
Southern Co—1,004,510 sh (to be offered to commonholders on 1-for-16 basis, record June 19 to expire July 10; company will set stock price; underwriter will be selected by competitive bidding on compensation)	.....	.....	June 18
Pacific Gas & Electric—2,271,300 sh (to be offered to stockholders on 1-for-5 basis, record June 10 to expire July 2)	.....	.....	.....
Public Service Co of New Mexico—173,135 sh (to be offered commonholders on 1-for-7 basis, late June or early July)	.....	.....	.....

Notes—(a) Stockholders allowed oversubscription privileges; and (b) Blyth & Co underwriters.

California Voters Favor Service by Shasta PUD

Voters in the boundaries of the Shasta Dam Public Utilities District near Redding, Calif., have encouraged the district's board of directors to go into the electric power distribution business on an unlimited scale.

The vote in a recent election was 197 to 147 in favor of the proposal.

At the present time the public utility district serves only a few commercial users while the Pacific Gas & Electric Co sells to home owners and provides electricity for street lighting.

The utility district directors already had the power to negotiate with PG&E for the purchase of the private firm's system in the district but the board members wanted an expression from the voters on the issue.

The election result also is considered by the directors as an expression of the voters on possible condemnation action against PG&E system.

The Shasta District's customers, a few small industries and lumber mills, are served power bought from the Bureau of Reclamation's Shasta power plant.

FINANCIAL BRIEFS

Washington Water Power Co's Pres Kinsey Robinson has told a group of security analysts who visited the Pacific Coast recently that the company is paying 30¢ a share quarterly at present but he intends to recommend to the directors, that the rate be raised to 35¢ a share before end of year.

Commonwealth Edison Co plans "to make an offering of mortgage bonds about the middle of July" in connection with its total requirements of about $300 million additional capital in the next three years.

Jerome S. Katzin has been appointed by the Securities and Exchange Commission as director of division of public utilities, succeeding Morton E. Yohalem who resigned. He will take over his new duties July 1.

Atlantic City Electric Co has declared a quarterly common stock dividend of 32½¢ a share against 30¢ previously, and also an extra of 5¢ a share, both payable July 15.

THE INDUSTRY'S FIRST STANDARDIZED "FAMILY"

of 5 KV Cutouts with interchangeable doors!

50 and 100 ampere cutouts, each with

new PND standard duty non-indicating doors

PVD standard duty indicating doors

PHD heavy duty non-indicating doors

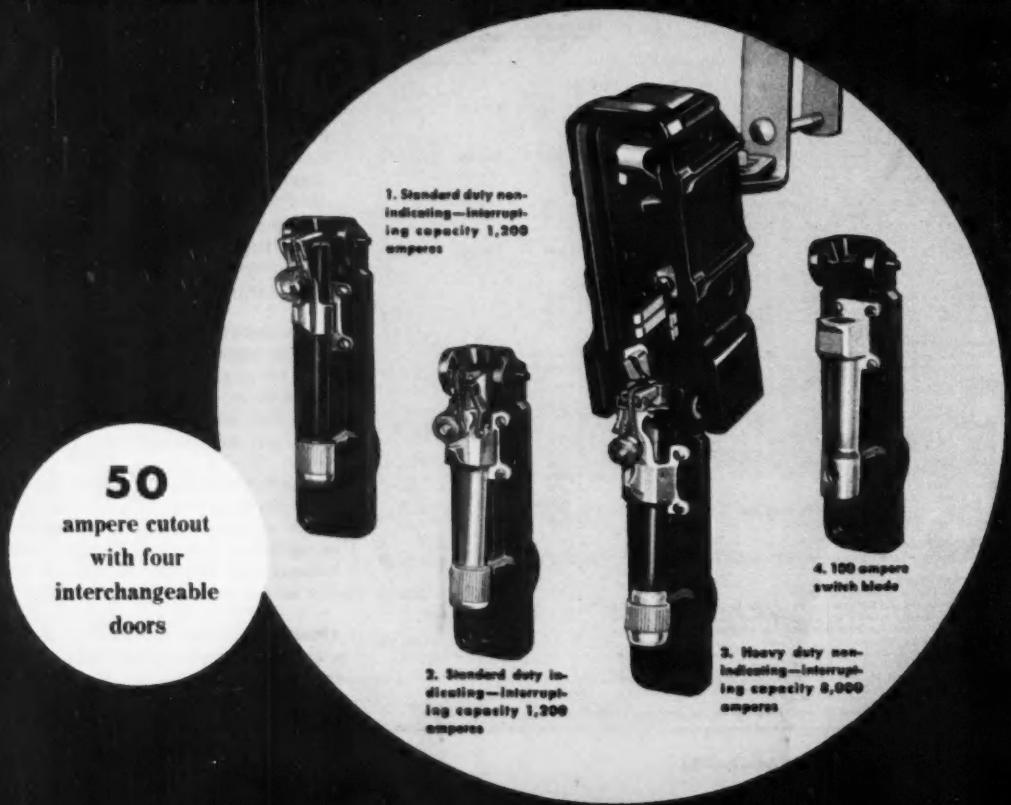
100 and 200 ampere switch blade doors

L-M, leading manufacturer of distribution cutouts, presents the first fuse cutout family offering complete interchangeability. 50 and 100 ampere boxes are offered, each taking care of four types of services.

Now—buy one box, with the doors you need for your present services. As operating requirements change, simply unhook the present door and hook on a new one. It's a 6-second job!

This new family saves space, time, and money in warehousing, installation, and operation. Safer, too! The lineman can remove the door completely, re-fuse, and replace it, all with the *switch stick*. When door is open, all door parts are dead.

Get the Whole Story. Ask the L-M Field Engineer; or write Line Material Company, Milwaukee 1, Wis. (a McGraw Electric Company Division).


1. Standard duty non-indicating—interrupting capacity 1,200 amperes
2. Standard duty indicating—interrupting capacity 1,200 amperes
3. Heavy duty non-indicating—interrupting capacity 8,000 amperes
4. 100 ampere switch blade

50
ampere cutout with four interchangeable doors

L-M's New 5 kv "first family"

RATING	INTERCHANGEABLE DOORS AVAILABLE	INTERRUPTING CAPACITIES RMS AMPERES 2.5 kv	5 kv
50 AMPERES	1. "PND" standard duty, non-indicating	1,200 amperes	1,200 amperes
	2. "PVD" standard duty, indicating	1,200	1,200
	3. "PHD" heavy duty, non-indicating	8,000	5,000
	4. Switch Blade	100 amperes continuous current rating	
100 AMPERES	5. "PND" standard duty, non-indicating	3,000	3,000
	6. "PVD" standard duty, indicating	3,000	3,000
	7. "PHD" heavy duty, non-indicating	14,000	10,000
	8. Switch Blade	200 amperes continuous current rating	

"PVD," "PND," and "PHD" are L-M trademarks.

78

LINE MATERIAL

fuse cutouts

Complete Coordinated Equipment for Distribution Today

Also in 7.5 kv sizes

A 7.5 kv family is also available, with 50 and 100 ampere cutouts, each with four interchangeable doors. Doors can be bought separately.

Orders and Open Manufacturing Capacity for Electrical Equipment, 1952-1955

Total Capacity Shipped and on Order and Scheduled for Shipment	1951	1952	1953	1954	1955 and Later	Total Scheduled for Shipment as of 4-1-52	New Capacity Scheduled 4-1-51 to 4-1-52	Capacity Shipped 4-1-51 to 4-1-52
LARGE STEAM TURBINE-GENERATORS (10,000 Kw and Larger)[1]								
	(Shipped)							
For U. S. Utilities	4,559,500	8,373,700	9,849,200	8,878,000	660,000	26,390,900	9,471,900	4,676,500
For U. S. Industrials	320,000	834,000	430,500	890,000	.....	1,964,500	1,084,500	335,000
For Outside Continental U. S.	810,000	260,000	271,500	170,000	.....	631,500	271,500	880,000
TOTAL	**5,689,500**	**9,467,700**	**10,651,200**	**9,868,000**	**660,000**	**28,986,900**	**10,827,900**	**5,891,500**
Estimated Open Capacity	.....	.....	350,000	1,250,000	10,000,000			
SMALL STEAM TURBINE-GENERATORS (4,000 to 9,999 Kw)[1]								
	(Shipped)							
For U. S. Utilities	156,000	119,500	50,000	.....	.....	121,000	67,000	126,500
For U. S. Industrials	219,000	243,600	95,000	.....	.....	291,100	141,600	248,500
For Outside Continental U. S.	91,000	188,000	71,500	.....	.....	211,500	134,500	124,000
TOTAL	**436,000**	**544,100**	**216,500**			**623,600**	**343,100**	**499,000**
Estimated Open Capacity	.....	.....	500,000	1,100,000	1,100,000			
STEAM GENERATORS (450-Psi Pressure and Higher)[2]								
	(Shipped)							
For U. S. Utilities	45,878	90,737	93,287	23,605	425	190,539	99,690	56,363
For U. S. Industrials	16,086	34,769	10,535	1,500	.....	38,503	31,938	20,824
For Outside Continental U. S.	14,045	10,529	5,416	.....	.....	13,418	10,322	11,359
TOTAL	**76,009**	**136,028**	**109,238**	**25,105**	**425**	**242,460**	**141,950**	**88,546**
Estimated Open Capacity	.....	.....	45,000	150,000	180,000			
WATER-WHEEL GENERATORS (4,000 Kw and Larger)[1]								
	(Shipped)							
For U. S. Utilities	1,031,500	2,094,500	1,462,400	942,000	451,300	4,304,900	1,230,700	1,556,700
For U. S. Industrials	.....	26,200	.....	.....	.....	26,200	.....	.....
For Outside Continental U. S.	371,100	284,000	140,900	27,900	.....	421,300	158,700	280,800
TOTAL	**1,402,600**	**2,404,700**	**1,603,300**	**969,900**	**451,300**	**4,752,400**	**1,389,400**	**1,837,500**
Estimated Open Capacity	.....	.....	500,000	1,500,000	2,200,000			
HYDRAULIC TURBINES (3,000 Horsepower and Larger)[3]								
	(Shipped)							
For U. S. Utilities	2,031,700	2,524,700	1,804,100	1,942,400	1,728,900	7,656,800	2,934,700	1,854,600
For U. S. Industrials	.....	16,800	16,700,	.....	.....	33,500	.....	.....
For Outside Continental U. S.	128,800	332,700	310,400	.....	.....	559,600	202,000	152,300
TOTAL	**2,160,500**	**2,874,200**	**2,131,200**	**1,942,400**	**1,728,900**	**8,249,900**	**3,136,700**	**2,006,900**
Estimated Open Capacity	.....	.....	1,000,000	2,300,000	3,500,000			
POWER TRANSFORMERS (501 Kva and Larger)[4]								
	(Shipped)							
For U. S. Utilities and U. S. Industrials	34,597,000	45,737,000	40,036,000	13,504,000	717,000	89,569,000	59,091,000	36,849,000
For Outside Continental U. S.	2,220,000	1,971,000	1,363,000	250,000	.....	3,191,000	2,208,000	2,709,000
TOTAL	**37,217,000**	**47,708,000**	**41,399,000**	**13,754,000**	**717,000**	**92,753,000**	**61,299,000**	**39,558,000**
Estimated Open Capacity	.....	.....	9,000,000	40,000,000	56,000,000			

[1] Figures in kilowatts [2] Figures in 1,000 lb steam per hr [3] Figures in horsepower [4] Figures in kilovolt amperes

Power Equipment Outlook . . .

. . . is bright, EEI survey reveals. Status of manufacturers is improved because of favorable materials situation

From all indications things are looking up for the heavy electrical power equipment manufacturers. In general, the material situation has improved during the first quarter of 1952. Allocations have been more in line with requirements, and manufacturers have had improved success in obtaining materials from suppliers.

Manufacturers Supply Data . . . This industry picture is presented in the 11th semi-annual electric power survey of Edison Electric Institute. The survey is based on figures supplied by 19 of the country's leading manufacturers of heavy electrical power equipment, which supply the utilities.

However, it is noted these improvements do not mean the 1951 production loss can be promptly recovered. It does mean if adequate supplies of materials continue to flow to manufacturers without interruptions, lost production will be recovered.

The EEI survey covers generators, hydraulic turbines, and transformers. It contains amounts of material ordered for delivery by 1955, delivery schedules, and amounts of estimated open manufacturing capacity available.

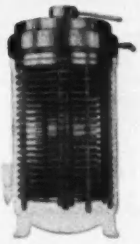
Manufacturers have scheduled for shipment about 36,836,700 kw of steam and hydro generators in 1952-1955. Aggregate capacity of extra equipment that could be manufactured and shipped in this period if orders were placed early enough totals some 18,500,000 kw (see table). Full manufacturing capacity is approaching 14,600,000 kw a year.

About 30,646,900 kw of large steam turbine-generators have been shipped or scheduled for shipment during the four years. Open manufacturing capacity of additional large generating units is estimated at 11,600,000 kw.

Estimated open manufacturing capacity of 350,000 kw for 1953 applies to units of 10,000 to 20,000 kw for delivery late in '53. In 1954, larger units are obtainable; in 1955 full range of sizes becomes available.

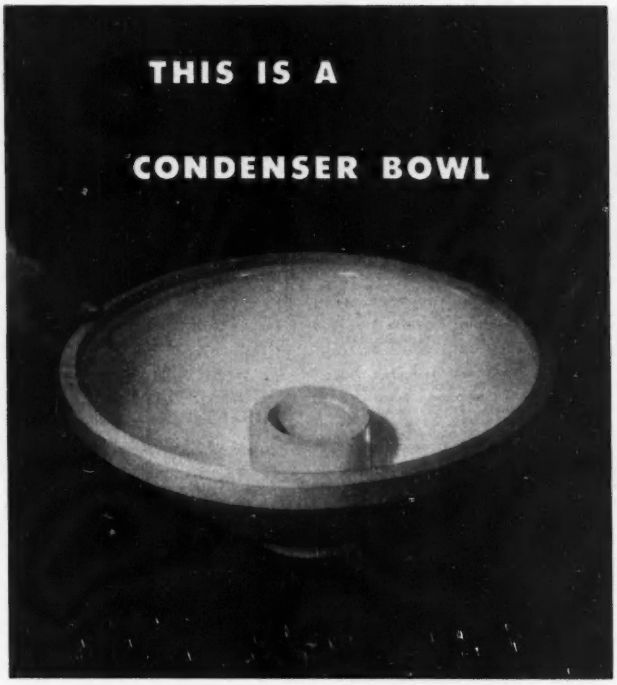
Full manufacturing capacity of large steam turbine-generators on a six-day week basis is about 10 to 11 million kw a year and for smaller ones about 1.1 million kw annually.

The present planned schedules for small steam turbine-generators are



It has an electrical and a mechanical duty to perform. It insulates and supports the rotor assembly for a pressure-gas-filled condenser, a Lapp product widely used in radio broadcast and other high-voltage, high-current, high-frequency circuits.

The requirement for low loss at radio frequencies —to keep down heating which would limit voltages and frequency at which the condenser could serve— dictates the use of a steatite body as ceramic for this bowl.



Maintenance of the dimensional tolerances required for such a piece presents a formidable challenge to the producer of a steatite body. Excessive warpage and variable shrinkage—in one direction as compared to the other—are traditional "bugs" in steatite—due to the form of the long flat scales which is the nature of the structure of steatite.

However, Lapp has pioneered in the production of steatite pieces of such size and shape. In fact, during World War II, a large production facility for such pieces was readily made available at Lapp, and throughout the war all requirements which we heard about were met.

It's a long way from a gas-filled condenser or an airplane antenna entrance insulator to a 69Kv line insulator or a sectionalizing cutout housing. Yet we of Lapp take the same order of pride in each. For all represent the same accomplishment —a device soundly designed and skillfully produced to do its job efficiently and dependably. It's an accomplishment which arises from detailed technical knowledge of the ceramic body, its characteristics and strengths, through which have been perfected advanced production and control techniques. The result is insulators, and insulating parts, of porcelain, or special ceramics, which offer an extra margin of operating security. Users of electrical porcelain may say it: *"Although you can buy cheaper porcelain—you can't buy better porcelain—than Lapp."*

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

considerably below the potential manufacturing capacity. This reflects the trends toward larger units, both for utilities in the U. S. and abroad, and for industrial use. Estimated open manufacturing capacity of 500,000 kw in 1953 is available for shipment late in '53. For 1954 it rises to 1.1 million kw and remains at this level for 1955.

Shipments made and scheduled of small turbo-generators total 760,600 kw for 1952-1955.

Shipments of steam generators 450 psi pressure and higher scheduled through 1955 total about 270,796,000 lb per hr. The estimated open manufacturing capacity of 45 million lb of steam per hr for 1953 is available for deliveries the latter part of that year. For 1954 it is 150 million lb of steam per hr, provided presently scheduled production will be largely completed by that time and that expanded facilities will be nearing their full effectiveness. Only a small number of steam generators have thus far been scheduled for shipment in 1955, so that practically the full product capacity, which will have reached an estimated 180 million lb, will be available.

Full manufacturing capacity for water-wheel generators is about 2.6 million kw a year. Shipments for the four years will be approximately 5,429,200 kw and open manufacturing capacity about 4.2 million kw.

To Reach 3.5 Million Hp . . . Open capacity for hydraulic turbines of 5,000 hp and larger totals 6.8 million hp in the 1952-55 period. The 1 million hp capacity for 1953 is available for units of smaller physical size for delivery in the latter part of the year. For 1954 it increases to 2.3 million hp and in 1955 it will reach 3.5 million hp. Capacity for manufacture, previously estimated as 4.5 million hp a year, is expected to increase due to expanding manufacturing facilities. Shipments scheduled for the four years total 8,676,700 hp.

About 103,578,000 kva of power transformers have been shipped or is on order and scheduled for shipment during the 1952-55 period. Schedules are full for 1952 but there is open manufacturing capacity estimated as 9 million kva in 1953. This increases to 40 million kva in 1954. By 1955 full effect of expanded facilities should be realized, giving a total manufacturing capacity of about 56 million kva a year.

NEW ELECTRICAL CONSTRUCTION

A weekly selection of U. S. electrical construction projects announced by private and government utility systems involving more than $70,000. Also listed are major industrial and construction jobs where electrical work is indicated or implied

UTILITIES

Proposed Construction

Arizona-Nevada—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Buckeye, Ariz., disconnecting switches, grounding blades, for Buckeye substation, Davis Dam Proj. Spec. DS 3727. L. N. McClellan, ch. engr.

California—Pacific Gas & Electric Co., 445 Sutter St., San Francisco, hydro-electric project on North Fork of Feather River and Butt Creek, two powerhouses, total capacity 153,000 kw., Plumas Co. $36,040,000.

Colo., Colorado Springs — City, City Hall, wiring North Steam Plant, $2,500,000. Lutz & May, 819 Finance Bldg., Kansas City, Mo., engrs.

Colo., Colorado Springs — City, City Hall, cooling tower basins and sub-station footings for North Steam Plant, $2,500,000. Lutz & May, 819 Finance Bldg., Kansas City, Mo., engrs.

Conn., New London—P. Wks. Office, Third Naval Dist., 90 Church St., New York 7, N. Y. modernization of Lighting Machine Shop Bldg. 29B U. S. Naval Submarine Base, NOY 70357, Spec. 31944. Plans deposit $10.

D. C., Wash. and Arlington, Va.—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., renovation electrical distr. sys. at Naval Receiving Station (Anacostia, D. C.) and Quarters "K" Arlington, NOY 71768, Spec. 33171.

Fla., Key West—City, 30 mi. 13.8 kv. electric transmission lines. Plans deposit $25. R. W. Beck & Assocs., Colorado Springs, Colo., engrs.

Neb., Ainsworth—K. R. R. Electric Co., Ainsworth, garage, $106,000.

Neb., McCook—McCook Public Power Dist., McCook, shop and warehouse with offices, $105,000.

N. C., Raleigh—Westinghouse Electric Corp., Meter Div., 95 Orange St., Newark, N. J., 1 story, 500 sq. ft. steel, brick meter mfg. plant, U. S. Rt. 1, near here, $5,000,000. Robert & Co. Assoc., 96 Poplar St., N. W., Atlanta, Ga., consult. engrs.

S. C., Columbia—City, City Hall, high and medium intensity lighting sys. at Columbia Airport. Plans deposit $10.

Texas and Oklahoma—Lone Star Gas Co., 1915 Wood St., Dallas, Tex. 70 mi., 20 in. transmission line, $1,400,000.

Tex., Big Spring—Howard Co., c/o Court House, 4 story basmt., court house, $750,000. Plans deposit $50. Puckett & French, 505 Petroleum Bldg., Lubbock, archts.

Tex., San Antonio — Sunshine Broadcasting Co. (KTSA), c/o Express Publishing Co. Bldg., modern television plant, incl. 1,000 ft. tower, $100,000.

Utah, Salt Lake City—Electro-Motive Div., General Motors Corp., LaGrange, Ill., diesel repair shop and parts warehouse, $600,000, equip. approx. $900,000.

Va., Norfolk—P. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, street lighting sys. at the U. S. Naval Base (Benmoreell), NOY 73591, Spec. 34667. Plans deposit $10.

Wash., Fort Lewis—Dpt. Army, Contg. Officer, Fort Lewis, exten. power distr. sys. from Mt. Rainier Ordnance Depot to American Lake Gardens, Inv. 52-124.

Alaska — Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Eklutna, one 750 kva, 6,600 delta to 12,470 grounded-wye/7,200 volt, 3 phase, 60-cycle, Class OA, outdoor power transformer, incl. insulating oil, with 3 tank-mounted lightning arresters on high-voltage side for Eklutna switchyard, Eklutna Proj. Inv. No. DS-3722.

Low Bidders & Contracts Awarded

Mich., Lansing—City, Otto E. Eckert, Bd. Water & Electric Light Comn., City Hall, Lansing, Mich. Own Forces. $162,000. constr. underground ducts for power line to new state office bldg. from Ottawa St. power plant, incl. cable, switch gear and installations.

Tex., San Antonio—Forgy Constr. Co., Box 6551, San Antonio, Tex., LB, $251,051, Lot 4, cold storage plant addn.;

Farnsworth & Chambers, Box 74, Houston, Tex., LB, $54,945, Lot 5, radio receiver bldg., Inv. No. Eng 41-243-52-100, for Brooks Medical (Aeromedical) Center, U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids May 17.

INDUSTRIAL, COMMERCIAL & PUBLIC BUILDINGS

Proposed Construction

Calif., El Toro—Dpt. Navy, San Diego, aircraft maintenance hangar, Tactical Area III, NOY 62539, Spec. 33732, $1,000,000; water and sewer extensions, NOY 71129, Spec. 32653, $500,000; public works bldg. NOY 71129, Spec. 32683, $1,000,000; barracks, NOY 71128, Spec. 32682, $1,000,000, all at Marine Corp. Air Station.

N. J., Paramus—Allied Stores Corp., 401 Fifth Ave., New York, N. Y., plans by John Graham & Co., 11 W. 42 St., New York 18, N. Y., shopping center, Route 4. $17,300,000.

Low Bidders & Contracts Awarded

Ind., Charlestown—E. I. du Pont de Nemours, du Pont Bldg., Wilmington, Del., CA, $18,487,500, will construct and operate expansion smokeless power production; CA, $2,400,000, expansion of facilities at Indiana Ordnance Works. U. S. Eng., 830 W. Broadway, Louisville 1, Ky.

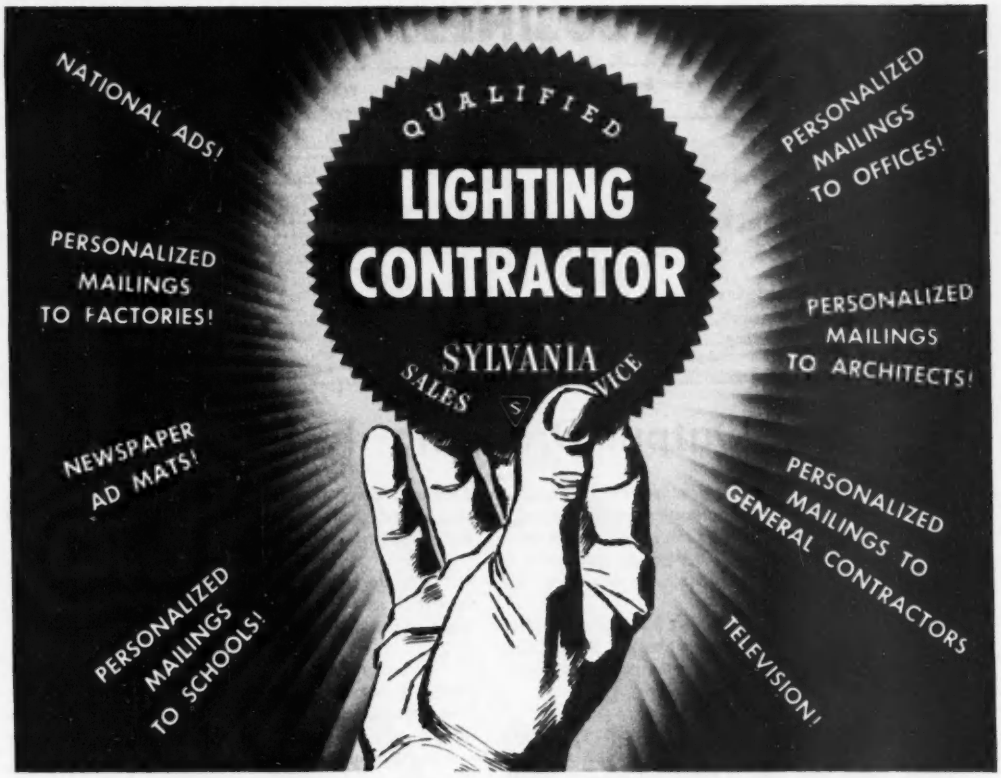
Pa., Phila.—John McShain, 17 and Spring Garden Sts., Phila. 30, Pa., LB $6,997,200, general constr.;

Willard Sales & Service Co., 2901 N. Broad St., Phila. 32, Pa., LB $959,860, heating;

Daniel J. Keating, 3917-27 Baring St., Phila. 4, Pa. LB $1,159,159, plumbing;

Ace Electric Service Co., 129 N. 3 St., Phila. 6, Pa. LB $928,695, electrical work;

Otis Elevator Co., 502 N. 19 St., Phila. 30, Pa., LB $315,230, elevators for main hospital bldg. and utility tunnel; doctors' and nurses' quarters with connecting corridors to main hospital for Eastern Pennsylvania Psychiatric Institute, General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids May 21.



Here's a Helping Hand that really means Business

A new powerful program that turns prospects into customers for Electrical Contractors.

Above is the emblem of an *all-around* program that sells the services of electrical contractors with: National Advertising in Time, Business Week, Newsweek, and a host of other magazines; also the popular, nation-wide TV Show "Beat The Clock."

Plus 3 coordinated and personalized direct mail campaigns sent to prospects by Sylvania. Plus FREE Newspaper ad mats. Plus free, carefully prepared talks and radio spot announcements. Also a Lighting Installation Plan Book and many other wonderful helps. *And, believe it or not, its cost is so low, Electrical Contractors agree it's next to nothing!*

Lighting Contractors say:

"Sylvania's Contractor Program is a splendid business builder."

"We've shown a substantial increase since signing on the Sylvania Program."

"It's great . . . and Sylvania does all the work."

"Best program ever offered Electrical Contractors."

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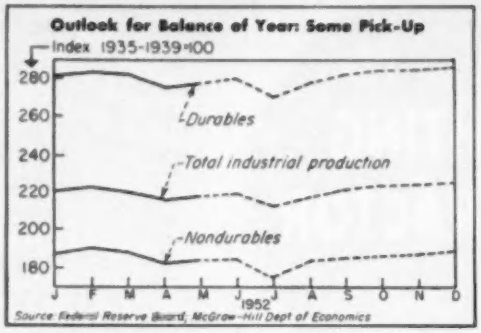
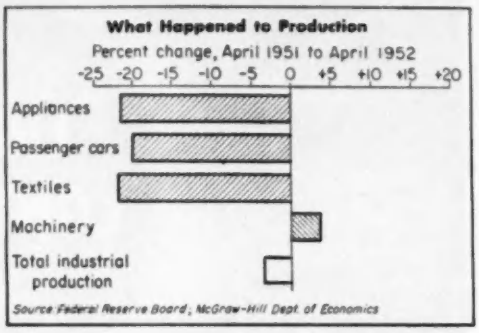
ELECTRICAL BUSINESS OUTLOOK




What Happened to Production
Percent change, April 1951 to April 1952
-25 -20 -15 -10 -5 0 +5 +10 +15 +20
Appliances
Passenger cars
Textiles
Machinery
Total industrial production
Source: Federal Reserve Board; McGraw-Hill Dept. of Economics

Industrial Output Dropping; Fall Rise Likely

Industrial production dropped again in the second quarter, confounding many business forecasters who expected a rise. The Federal Reserve index for April was down to about 216, compared with 222 in February and a peak of 223 last year. Preliminary estimate for May was 220.

The steel strike accounts for at least 3 points of the drop in April. And steel production wasn't back to normal early in May either. Other strikes—oil refineries, for example, also pulled down the index.

But you can't blame all the drop on strikes. There have been sharp cutbacks in production of textiles and consumer durables. Other lines, such as paper and some chemicals, continue to show weakness.

The Old Story—Too Much Inventory . . . It's the same old story with consumer goods—too much inventory. Retailers have worked down their stocks. In fact, they'd pretty much done so by the first of this year. But when manufacturers pushed production up again in the first quarter, they found goods accumulating all over again.

The point seems to be that these industries just can't operate at capacity any more. Consumers aren't taking the merchandise fast enough. And capacity is way up. The company which once had to run full tilt to fill all orders doesn't have to today because competitors have extra capacity too. If they all run at capacity, inventory piles up.

There probably won't be a sharp upswing in business generally before fall. We're close to the summer vacation season now. That always means shutdowns in textiles and other lines with industry-wide vacations.

But there may be a real pick-up after Labor Day. That's the big season for consumer goods production. And these industries used to readjustment could snap back pretty fast.

Heavy industries, like steel and machinery, will still be operating close to present levels. And armaments production will increase steadily. So in the fourth quarter industrial production could range from 220 to 225.

Consumer Durables Output May Rise . . . Here's why consumer durables production may snap back after the present high inventories are worked down.

1. Prices are being cut. Distributors are doing it now—showing manufacturers it has to be done to move goods. Many manufacturers will have to follow before '52 is over.

This is important. Consumer surveys show that many families have been priced out of the market for automobiles, furniture, and electrical appliances. They've been spending more on food and rent, haven't had the extra cash to spend on durables. Also there's been a general feeling that prices are too high—not good values.

2. New models will help. Most of the stuff that's not selling now is left-over 1951 models—or 1952 models that aren't very different. Really new items—like air-conditioners, or the new model Ford—are selling well.

Auto and appliance makers are aiming at real changes in their merchandise for 1953. And they'll rush to get the 1953 models on the market by fall.

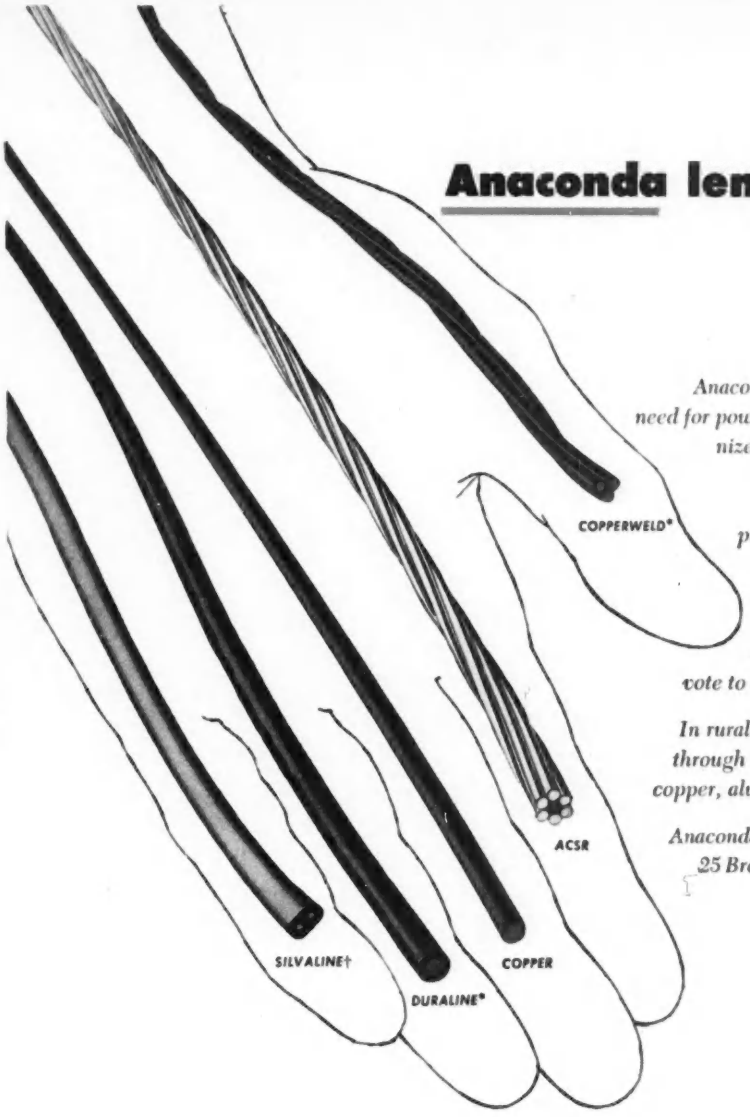
Remember the "scare buying" wave in 1950-1951? People who bought then haven't been tempted to buy new cars or refrigerators since because all they could get were the same basic models. But they may be sold something new.

3. There'll be more cash around. The period of heaviest income tax collections is over. Restrictions on consumer credit have been repealed. And there's another round of wage increases underway.

This won't be as big a wage round as last year. But it may increase real income more because the cost of living isn't rising much now. So for the first time in over a year, there will be extra money accumulating to spend on durables.

About this time, the textile cycle should be turning too. And the general pick-up in consumer lines should help other industries—chemicals, plastics, paper, and some machinery makers—who sell to consumer goods makers.

Anaconda lends a hand



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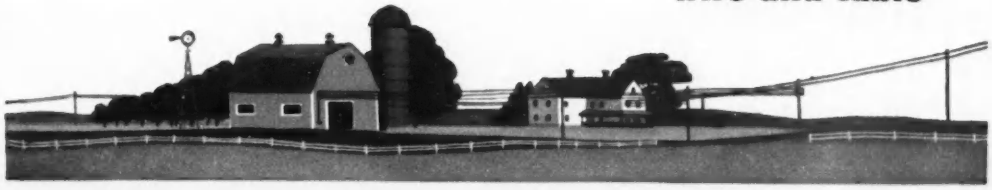

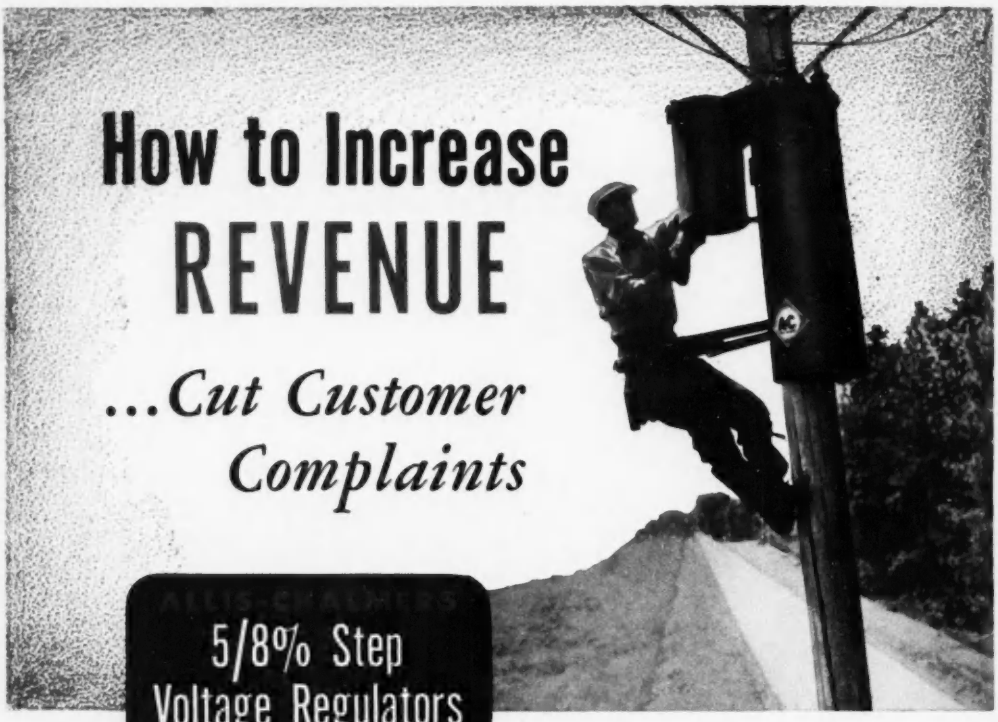

Power Company Regulates Entire System — finds it pays off with double return

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Get the complete story. Write or call your nearby A-C district office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-3748

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